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"FOCAL INFECTION" IN RELATION TO RHEUMATIC DISEASES: A CRITICAL APPRAISAL

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The problem of focal infection in relation to systemic diseases, especially rheumatic diseases, has received too little critical study. The subject needs to be approached first from the standpoint of the nature of systemic disease. In other words, what is arthritis? What is rheumatism?

The term "rheumatic disease" embraces a large group of different illnesses which have as their chief characteristic pain in or around joints. "Rheumatism" is not a disease but a generic term for many diseases. Rheumatic diseases can be divided into two groups; namely, (1) affections of the joint structures themselves, that is, true articular disease or arthritis, and (2) illnesses that are non-articular.

Table 1 gives a simple classification of the common forms of arthritis. The causes of some are known and of others unknown. In infectious arthritis the etiologic organisms are known and usually exist in the tissues of the joints. Characteristic examples are gonococcal, pneumococcal, meningococcal and tuberculous arthritis. The arthritis of rheumatic fever is usually a problem of acute disease. In the classification are numerous other types of arthritis, but in this paper attention will be concentrated on rheumatoid arthritis and osteo-arthritis, which occur with about equal frequency, accounting for more than 90 per cent of cases of chronic arthritis. Rheumatoid arthritis differs greatly from osteo-arthritis in etiologic, clinical, pathologic and therapeutic considerations.

Rheumatoid Arthritis

Rheumatoid arthritis is a systemic disease, the chief manifestations being the articular changes. From its inception the disease characteristically affects many points of the extremities and sometimes joints of the spinal column. The patient is usually middle-aged although this disease may occur from infancy to old age. Before the articular disease becomes manifest the patient may complain of malaise, fatigue, poor appetite and loss of weight. Then usually several joints begin to ache and become increasingly

Read before the New York Institute of Clinical Oral Pathology, December 1945.

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Table 1.—Classification of Articular Disease Adopted by the American Rheumatism Association, 1941

1. Specific infectious arthritis (organism known)
2. Arthritis of rheumatic fever
3. Rheumatoid arthritis (synonyms: atrophic, proliferative and chronic nonspecific infectious arthritis, Still's disease, Marie-Strümpell spondylitis)
4. Osteo-arthritis (synonyms: degenerative joint disease, hypertrophic arthritis)
5. Arthritis of immediate traumatic origin
6. Arthritis of gout
7. Arthritis of neuropathic origin (Charcot's joint)
8. Neoplasms of joints
9. Miscellaneous forms (arthritis associated with other diseases)

painful, swollen, tender and oftentimes dull red in color. If the joints of the fingers are involved, the fingers become fusiform in shape as a result of capsular swelling of the proximal interphalangeal joint (Fig. 1). This localization is a fairly dependable diagnostic feature. The swelling, which usually can be palpated, is caused by inflammation, and all the classical signs of inflammation exist, including increased local temperature.

As the disease progresses these changes become more marked, and secondary changes, which cause deformities and interference with joint function, begin. Atrophy develops in surrounding muscles and skin. As the disease progresses further, these secondary changes advance and complete destruction of the joint may occur (Figs. 2 and 3).

It is important to understand the pathologic changes that characterize rheumatoid arthritis. The primary and characteristic pathologic change is inflammation, not of the bone or articular cartilage but of the synovia which lines the capsule and of the fibrous capsule of the joint. This causes diffuse thickening of this structure and accounts for the clinical changes described. From the inflamed synovia proliferative inflammatory tissue (pannus) grows inward toward the center of the joint covering the articular cartilages. Pannus causes irregular destruction of underlying cartilage resulting in roughening and irregularity of the articular surface. Osteoporosis of the metaphyseal portion of the bone and other secondary osseous changes develop early in the inflammatory stage.

As the disease progresses the inflammation persists and the destruction of cartilage increases, causing greater functional interference and often angulation or other deformities of the joint. Reparative changes, with fibrosis and scar tissue formation, follow the inflammatory stage. Progressive fibrosis results in ankylosis which is first fibrous in nature. Later this tissue may become calcified and result in true bony ankylosis.

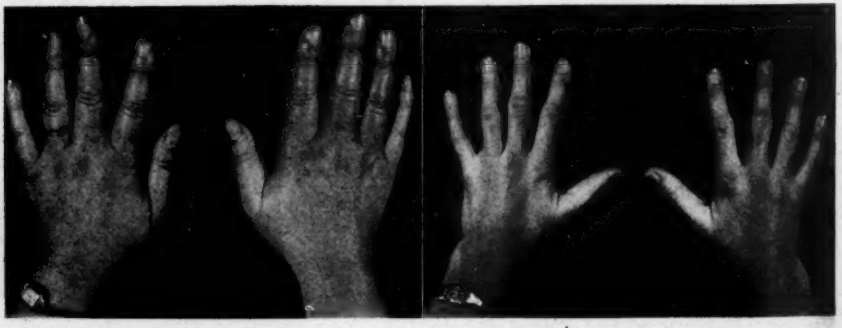

Fig. 1.—Early rheumatoid arthritis. Left: Inflammation of the proximal interphalangeal and metacarpophalangeal joints with generalized swelling of fingers. Right: Characteristic fusiform fingers as a result of inflammation of proximal interphalangeal joints.

Fig. 2.—Rheumatoid arthritis, late stage. Crippling of the hands as a result of destruction of cartilage and bone. Ulnar deviation of the fingers is common.

To summarize, the pathologic changes of rheumatoid arthritis consist of inflammation of the synovia and joint capsule and then secondary changes with destruc- of the cartilage, atrophy of the bone, deformity, dislocations and ankylosis.

The laboratory changes that accompany rheumatoid arthritis are usually mild or moderate anemia and oftentimes leukocytosis, which later may change to an abnormal or reduced white blood cell count. Fever may occur at the beginning of the disease or at other stages in its course. There is practically always an increased erythrocyte sedimentation rate. Roentgenologic examinations show the previously described changes in the bones and joints.

The cause of rheumatoid arthritis is unknown. The four most popular theories regarding the causes, in the order of popularity, are (1) infectious, (2) metabolic and nutritional, (3) endocrine and (4) neurogenic. The infectious theory will be discussed last.

Numerous metabolic and nutritional abnormalities may exist in patients who have rheumatoid arthritis, but all attempts to show that they provoke the disease have failed. There are persons who think the disease is primarily an endocrinopathy. It is true that various endocrinologic abnormalities are observed in cases of rheumatoid arthritis, but no one has shown that they are a causative factor. Certain neurologic and neurovascular changes likewise frequently occur, but again an etiologic relationship never has been proved.

There is more evidence to support the infectious theory for rheumatoid arthritis than any other explanation. In the first place, some patients give a history that the disease began shortly after an infection, oftentimes localized in the upper portion of the respiratory tract or in the oral cavity. The inflammatory nature of the pathologic changes in the joints and the fever, leukocytosis and increased sedimentation rate suggest an infectious basis. However, there are illnesses that are known to be noninfectious that are characterized by inflammation. Gout, for example, is a metabolic disease characterized by attacks of inflammation of joints which are in no way related to infection. These clinical features, suggestive as they are, are not infallible evidences that rheumatoid arthritis is caused by an infection.

The theory of "focal infection" began many years ago, was popularized by Billings[1] and was warmly received by those persons who were struggling with the problem of arthritis because it suggested a reasonable approach to the disease. As years passed the results failed to support the early enthusiasm.

Direct attempts to study this question

1. Billings, F.: Chronic Focal Infections and Their Etiologic Relations to Arthritis and Nephritis. Arch. Int. Med. 9:484, 1912.

Fig. 3.—Rheumatoid arthritis, late stage. Extreme crippling and flexion contracture deformities of the fingers.

include culture of the blood which has been done thousands of times in different laboratories by various workers using many different technical procedures, and no one has consistently found organisms that could account for the articular disease. Cultures of joint fluid, synovial membrane and capsular structures likewise have failed to furnish evidence of infection in the joints to account for the clinical and pathologic changes. Cultures of the lymph nodes in the region of affected joints, swabbings of the tonsils, the tonsils after removal, and teeth and tooth sockets have failed consistently to reveal any organism that can cause rheumatoid arthritis.

Attempts to produce the disease in animals by the use of all sorts of organisms have failed. It is true that arthritis has been produced repeatedly in animals by the injection of organisms removed from persons who had rheumatoid arthritis, but the articular disease always has been purulent and unlike the inflammation that characterizes rheumatoid arthritis in human beings. Reports in the literature that arthritis has been caused in animals by the injection of organisms or by sealing them in teeth to simulate a so-called focus of infection are true, but it must be clearly appreciated that nobody has produced in animals the counterpart of *rheumatoid arthritis in man.*

Certain observations *indirectly* suggest an infectious basis for rheumatoid arthritis. The finding of a high titer of streptococcal agglutinins and precipitins in the blood of persons with chronic rheumatoid arthritis suggests a relationship to streptococcal infection, but there is no proof of such a relationship. Studies of skin sensitivity suggest that streptococcal infection may be closely related to this disease. Those persons who feel that streptococcal infection causes rheumatoid arthritis cannot explain why the sulfonamides and penicillin fail to produce a beneficial effect. It is obvious that there is no infectious process in these patients that is caused by organisms that are susceptible to such antibiotic substances. Although therapeutic vaccines of all varieties have been produced, there is less enthusiasm now for vaccines as successful treatment for rheumatoid arthritis than there was ten or more years ago.

One is left without proof and with many questions as to whether infection of any sort accounts for this disease. I would emphasize, therefore, that the infectious nature of rheumatoid arthritis is *only a theory,* and that the term "chronic nonspecific infectious arthritis" used oftentimes to refer to rheumatoid arthritis lacks substantiation.

From a practical standpoint, two questions arise: What is the significance of infection in relation to rheumatoid arthritis, and what is the significance of so-called focal infection?

Reports in the literature of the incidence of foci in patients who have rheumatoid arthritis vary from as little as 20 per cent to as high as 80 per cent. This wide variation is accounted for in part by the differences in the physician's scrutiny of the patient and in criteria of what constitutes a focus of infection. Renowned otologists examining the same patient often differ in their opinion as to whether the tonsils are a focus. A clear-cut definition and identification of a focus of infection is not easy. Are tonsils, for instance, that weep pus from large crypts, foci? Although this seems reasonable, perhaps the tonsils with small or sealed crypts are more likely to be foci for systemic disease because of failure of external drainage of the inflammatory products, thus favoring absorption of toxic material. Dentists have the same difficulties as physicians in trying to decide whether teeth are foci of infection. The decision is not easy and must be based on clinical judgment.

To prove that a focus of infection causes arthritis the following evidence

must exist: 1. A focus must be found consistently. 2. Some substance, such as bacteria, bacterial products or host cell products of inflammation, must get from that focus to the affected parts, that is, the inflamed joints. It has never been shown that there is any toxin that circulates in these patients. An allergen may originate in a localized infection, and an allergic reaction may cause inflammation in joints, but such an allergen never has been shown to exist. 3. The inflammation in the joints must be proved to be the result of "x substance" that gets from a focus to the parts inflamed. Since this three-linked chain of evidence is not supported factually, focal infection as the cause of rheumatoid arthritis remains a theory.

If all theoretical considerations are disregarded, what is the practical importance of foci of infection in the therapeutic program of patients who have rheumatoid arthritis? What is the value of removal of foci in alleviating the articular disease, preventing its spread, checking its progress and causing subsidence of the disease?

Ten or more years ago most physicians considered the removal of foci of infection an important factor in treatment. Eight years ago when I visited most of the rheumatism centers in this country, one of the few questions I asked of all the workers was, "What do you think about the problem of foci of infection in relation to rheumatoid arthritis?" Three of ten outstanding authorities felt that removal of foci was an important part of treatment, since it was their *clinical impression* that patients were benefited thereby. Five were in doubt regarding the value of removal of foci of infection in the treatment of rheumatoid arthritis. Two of the authorities were staunch in their belief that removal of foci of infection made absolutely no difference in the course of the rheumatic disease.

In 1938, Cecil and Angevine[2] reviewed the problem of focal infection in 200 cases of typical rheumatoid arthritis. In 92 cases (46 per cent) the tonsils previously had been removed even though a history of tonsillitis existed in only 30 cases (15 per cent). Tonsillectomy had been of no benefit and, in fact, had caused severe exacerbation in 2 cases. Infection of the teeth or gums had existed in 52 patients (26 per cent). There was no alleviation of the arthritis after the extraction of some or all teeth in 47 cases. In 3 cases the arthritis was worse after the extraction of teeth. The observations of Cecil and Angevine left much doubt as to the *therapeutic* value of removal of foci of infection, and they advised careful reconsideration and further clinical evaluation of this problem.

After eight years of study of this problem clinically in a large number of patients, together with laboratory and animal experimentation, I have an extremely conservative attitude regarding the therapeutic value of removing foci of infection in cases of rheumatoid arthritis. Occasionally patients who have had arthritis for only a few months have improved in a way that suggested that some benefit had resulted from removal of the infection. However, I have yet to see a patient who has had rheumatoid arthritis for more than a year in whom there has been any evidence of benefit to the articular disease from removal of foci of infection from the oral cavity, pharynx, abdomen or pelvis. The numerous patients I have observed who have had the teeth removed, the sinuses punctured or radical operations performed, the tonsils out once, twice or three times, the gallbladder removed, a prostatectomy performed or the pelvis exenterated, all without relief from the

2. Cecil, R. L, and Angevine, D. M.: Clinical and Experimental Observations on Focal Infection with an Analysis of 200 Cases of Rheumatoid Arthritis. Ann. Int. Med. 12:577, August 1938.

arthritic condition, support the validity of my conservative attitude. If foci of infection are to be removed, this should constitute only one procedure in a broad program of treatment.

The dentists recognized the limitations of removal of foci earlier than did the physicians. Unfortunately too many physicians, if the tonsils have already been removed, assume that if there are some teeth present, they *must* be the cause of the arthritis. The patient is then sent to the dentist to have the teeth extracted. It is deplorable that teeth are being removed just because they are still in the mouth of the patient with rheumatoid arthritis. This practice should be stopped!

To recapitulate, the cause of rheumatoid arthritis is unknown. The infectious basis for the disease is only theoretical; whether or not it is caused by foci of infection is unknown. If foci are identified, a conservative attitude regarding their relationship to the arthritis must be adopted for best management of the patient.

My remarks should not be interpreted to mean that I never advise removal of teeth, tonsils or other parts that might harbor infection. If apical abscesses are present, the affected teeth should be removed; in certain other circumstances some or all of the teeth might better be removed. I may advise tonsillectomy or eradication of other infection, but I explain to the patient that such procedures may not directly influence the course of the arthritis. Two considerations should govern the management of foci of infection: 1. Just as a person without rheumatic disease should have abscessed teeth or infected tonsils removed, so should the patient with rheumatoid arthritis. 2. By removal of such infected tissues, the patient's general health might be improved and thereby his ability to combat the arthritis might be *indirectly* facilitated. The patient should be warned that removal of foci will not be of *direct* value as treatment for his arthritic disease.

Likewise I do not wish to give the impression that I do not believe that rheumatoid arthritis might be caused by focal infection. I feel very strongly that rheumatoid arthritis results from some alteration of host tissue as a result of a "trigger mechanism" that in most cases probably is localized infection at the roots of teeth, tonsils or elsewhere. The trigger mechanism may be noninfectious, such as a tumor or trauma. Host tissue damaged by any such initiating illness may liberate antigenic substances which react with antibodies in joint synovia and capsule causing inflammation. Once initiated in this way, rheumatoid arthritis may continue, recur or become exacerbated without continuation or recurrence of the original trigger mechanism. Localized infection, therefore, must be considered in two different lights; namely, (1) as a possible initiating factor, and (2) from the standpoint of treatment of the arthritis. The problem of foci of infection in relation to rheumatoid arthritis is a problem of prophylaxis much more than of therapy.

Osteo-arthritis

Osteo-arthritis is a local disease of joints, occurring in late middle age and old age. The patients are generally healthy but oftentimes obese. A few joints are irregularly swollen. When the fingers are involved, usually the end joints are irregularly swollen as a result of the formation of so-called Heberden's nodes (Fig. 4). These nodes are not caused by inflammation but are the result of degenerative changes in the articular cartilages and secondary irritative phenomena which cause hypertrophic, osteophytic proliferation at the osseous border of the joint. Besides the distal interphalangeal finger joints, the weight-bearing joints, especially the knees, hips

Fig. 4.—Osteo-arthritis showing characteristic Heberden's nodes of large size of the terminal interphalangeal joint of the third finger and beginning nodes in the fifth fingers.

and articulations of the spinal column, are commonly affected. These are the patients who say, "Doctor, I am all right except for this knee. Can you fix this joint so that it will not creak and ache when I go up and down stairs or feel stiff after I have been sitting for a while?"

The pathologic changes of osteo-arthritis are entirely different from those of rheumatoid arthritis, as revealed by all laboratory and roentgenologic examinations. In the early stages there is no inflammation of the capsule such as characterizes rheumatoid arthritis. There are degenerative changes with fibrillation of the articular cartilage at the place of greatest weight-bearing or use, usually in the central portion of the joint. As the disease progresses these degenerative changes advance, the cartilage becomes thinned and the surface irregular, and the underlying bone becomes eburnated. Osteophytic proliferation at the edges of the joint produces hypertrophic spurs which characterize the disease and account for the fact that it is frequently called hypertrophic arthritis. Further progression of the disease results in increased articular and osseous changes and irregularity of joint surface, weight-bearing becomes more painful and crepitation and limitation of motion increase.

Since infection plays no part whatsoever in the production of osteo-arthritis, removal of foci of infection cannot possibly be of any therapeutic importance to this disease process. However, frequently a patient who complains of pain in the shoulder or knees is assumed to have arthritis caused possibly by infection in the tonsils or teeth. Infected tonsils or apical abscesses may be found, and the infected parts are removed. Often no infection is found. Many times the teeth are removed on suspicion. It may be necessary and wise to remove certain teeth, tonsils or other parts just as in the case of persons who do not have arthritis, but it is a mistake to remove infected parts with the expectation of benefiting osteo-arthritis.

Nonarticular Rheumatism

Table 2 lists a large group of nonarticular diseases, all of which are forms of rheumatism. The problem of causation of these conditions is comparable to that of rheumatoid arthritis. In some instances the condition follows trauma but usually the cause is unknown. Localized infection may be found and in some cases there appears to be improvement in the rheumatic disease after eradication of foci. This is more likely to occur if the infection is eliminated early in the illness. I think that improvement in cases of nonarticular rheumatism is more frequent than in cases of rheumatoid arthritis, but again it is only in the minority of cases that the rheumatic disease improves. Consequently a conservative attitude in regard to both the theoretical

Table 2.—Clinical Forms of Nonarticular Rheumatism

Bursitis
Tendinitis
Tendon attachment syndrome
Tenosynovitis
Fasciitis—palmar, plantar
Periarthritis of shoulder
"Frozen shoulder"
Painful stiff neck
Lumbago
Neuralgia
Fibrositis

and practical considerations of the relation of infection to nonarticular rheumatism is advisable.

Postinfectious Arthritis

A type of arthritis which should be called "postinfectious arthritis" occurs, although in comparison with rheumatoid or osteo-arthritis the incidence is small. Considerable study of the patient and good judgment are required for proper diagnosis. It should be emphasized that postinfectious arthritis is rare in relation to the incidence of rheumatoid and osteo-arthritis.

Such a patient may have severe tonsillitis, an "ulcerating tooth" or other localized infection, and *during convalescence* from that infection, synovitis appears in one, sometimes in two and rarely in more joints. Removal of the localized infection is proper treatment for this rheumatic disease. Oftentimes the foci are removed before the synovitis is manifest, but if they have not been removed, then prompt elimination of infection, which may mean removal of teeth or tonsils, is wise.

Summary

In appraising the problem of infection in relation to arthritis, the first consideration should be whether the patient has arthritis or some condition that simulates arthritis. It is deplorable that analysis of some reports in the literature that a large percentage of patients with so-called arthritis were benefited by removal of infected tonsils or teeth indicates that most of the patients did not have arthritis but had some nonarticular lesion which would have improved regardless of the type of treatment.

First, then, one needs to know whether the patient has arthritis. Second, if he has arthritis, what kind of arthritis is it? Third, can infection reasonably be the cause of that type of arthritis?

The chief problem concerns the management of foci of infection in cases of rheumatoid arthritis. It is illogical to expect to cure gonococcal arthritis, other types of specific infectious arthritis or gouty arthritis by removing the teeth or the tonsils even if they are infected. Still, how often patients with such illnesses have had foci removed before the true nature of their disease had been determined! The infectious basis for rheumatoid arthritis has not been proved and no infectious organisms have been found in articular structures. The theory that localized infection may be an important etiologic factor, acting as a "trigger mechanism" in many cases, seems reasonable. Once rheumatoid arthritis is established, it seems to have capabilities of continuing independent of localized infection. Theoretically it seems doubtful whether removal of foci of infection would be helpful in cases of rheumatoid arthritis of long duration. Careful clinical observations substantiate this viewpoint. Therefore, foci of infection in patients with well-established rheumatoid arthritis should receive the same consideration as in nonarthritic patients, that is, on the basis of the local tissues involved in the infection and in regard to the patient's general health. The management should be based on good understanding as to the expectations and the limitations of removal of foci of infection. If foci of infection are attacked, this should be only one part of a broad program of treatment. The removal of infected parts should not be relied on to cure arthritis. The focus of infection in relation to rheumatoid arthritis is a problem more of prophylactic than of therapeutic nature.

Infection has no direct relationship to osteo-arthritis so that removal of localized infection could not possibly benefit this prevalent form of chronic arthritis.—*321 East Forty-Second Street.*

FURTHER STUDIES OF EXPOSED PULPS AS PORTAL OF ENTRY FOR POLIOMYELITIS VIRUS

Myron S. Aisenberg, D.D.S., Baltimore*

An opportunity for a further statistical study of the incidence of pulpal exposures in persons with and without poliomyelitis presented itself in August 1945, when a large number of cases appeared in northern New Jersey.

Table 1 shows the age distribution and the incidence of pulpal exposures in persons with and without poliomyelitis. The mouths of eighty-three children and adults being treated at the Jersey City Medical Center, Passaic Municipal Hospital, Patterson Memorial Hospital and Bergen Pines Hospital were examined for pulpal exposures. Forty-five patients (54.3 per cent) with poliomyelitis showed pulpal exposures. In order to compare the incidence of pulpal exposures in persons who did not have

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Table 1.—Age Distribution and Incidence of Pulpal Exposure in Persons with and Without Poliomyelitis in Northern New Jersey

Poliomyelitis Cases				Cases Without Poliomyelitis			
Age	Number of Cases	Number of Cases with Exposed Pulps	Number of Cases with Pulps Not Exposed	Age	Number of Cases	Number of Cases with Exposed Pulps	Number of Cases with Pulps Not Exposed
3	5	2	3	3	7	1	6
4	9	3	6	4	3		3
5	8	3	5	5	10	2	8
6	12	9	3	6	12	5	7
7	11	6	5	7	16	5	11
8	3	3		8	7	1	6
9	3	3		9	6	1	5
10				10			
11	5	3	2	11	6	1	5
12	5	3	2	12	9	1	8
13	5	2	3	13	7	2	5
14	4	2	2	14	7	3	4
15	1	1		15	6	1	5
16	1	1		16	5	1	4
17	1		1	17	4		4
18	2	1	1	18	2	1	1
19	1		1	19			
22	1		1	22			
25	1		1	25			
27	1	1		27			
28	1	1		28			
31	1		1	31			
32	1	1		32			
45	1		1	45			
Total	83	45	38	Total	107	25	82

poliomyelitis, the mouths of 107 children and young adults of the same age distribution were examined in Memorial School No. 11 of Passaic, the Passaic Day Nursery and the Passaic Home and Orphan Asylum. Data from 3-year-old children only were obtained from the last two institutions. Of these 107 patients, twenty-five (23.3 per cent) showed pulpal exposures. The difference of 31 per cent in the incidence of pulpal exposures in the two groups is 2.3 times twice the standard error of difference and is statistically significant.

Since the data[1] obtained from three states showed that patients with poliomyelitis had a higher incidence of pulpal exposures than those not having had poliomyelitis, it was reasoned that a comparison of the incidence of poliomyelitis in a low caries and high caries population should show a similar difference, that is, less poliomyelitis in a low caries population. A near approach to such figures is available.

Arnold[2] has reported that about a 60 per cent lower dental caries experience is expected in populations whose potable water contains 1 part per million or over of fluorine. Less caries indicates fewer exposed pulps.

Table 2 shows the population and total number of cases of poliomyelitis

1. Aisenberg, M. S., and Grubb, T. C.: Exposed Pulps of Teeth as the Portal of Entry for Poliomyelitis Virus. J.A.D.A. 32:555, May 1, 1945.

2. Arnold, F. A., Jr.: Role of Fluorides in Preventive Dentistry. J.A.D.A. 30:499, April 1, 1943.

Table 2.—Population and Total Number of Cases of Poliomyelitis for a Period of Ten Years in Communities with Drinking Water Containing Less Than 1 P.P.M. of Fluorine

City	Population	Fluorine P.P.M.	Total Number of Poliomyelitis Cases for Ten Years
Elgin, Ill.	38,333	0.5	29
Evanston, Ill.	65,389	0.0	57
Kewanee, Ill.	16,901	0.9	4
Oak Park, Ill.	66,015	0.0	86
Quincy, Ill.	40,469	0.1	28
Waukegan, Ill.	34,241	0.0	17
Pueblo, Colo.	52,162	0.6	109
Buffalo, N. Y.	575,901	0.0	1,137
New York, N. Y.	7,454,995	0.0	5,375
Hartford, Conn.	166,267	0.1	103
Bridgeport, Conn.	147,121	0.0	92
Providence, R. I.	253,504	0.0	385*
Pittsburgh, Pa.	671,659	0.0	344
Columbus, Ohio	306,807	0.2	74*
Indianapolis, Ind.	386,972	0.0	133
Louisville, Ky.	319,077	0.1	377*
St. Louis, Mo.	816,048	0.3	291*
Marion, Ohio	44,898	0.4	14
Lima, Ohio	44,711	0.3	15
Portsmouth, Ohio	40,466	0.1	34
Michigan City, Ind.	26,476	0.1	36
Baltimore, Md.	859,100	0.1	434
Total	12,427,512	.....	9,174

*Nine years.

Table 3.—Population and Total Number of Cases of Poliomyelitis for a Period of Ten Years in Communities with Drinking Water Containing 1 P.P.M. and Over of Fluorine

City	Population	Fluorine P.P.M.	Total Number of Poliomyelitis Cases for Ten Years
Geneva, Ind.	895	1.8	4
New Haven, Ind.	1,702	2.0	7
Lowell, Ind.	1,274	5.0	0
Goodland, Ind.	978	1.6	0
Churubusco, Ind.	1,095	1.6	2
Albion, Ind.	1,108	1.0	0
Columbia City, Ind.	3,805	1.0	3
Farmland, Ind.	853	1.2	0
Griffith, Ind.	1,176	1.0	1
Hartford City, Ind.	6,616	1.4	0
LaFountaine, Ind.	604	1.4	2
Lebanon, Ind.	6,445	1.0	0*
Lynn, Ind.	936	1.3	0
Mecca, Ind.	1,224	1.1	0
Milltown, Ind.	795	1.2	0
Morristown, Ind.	688	1.2	1
New Richmond, Ind.	391	1.0	0
Pennville, Ill.	578	1.0	0
Portland, Ill.	5,276	1.1	6
Schneider, Ill.	264	1.1	0
Bradley, Ill.	3,689	1.1	1
Canton, Ill.	11,577	2.1	10
Lemont, Ill.	2,557	1.4	4
Riverside, Ill.	7,935	1.8	8
Zion, Ill.	6,555	1.2	5
Clovis, N. Mex.	10,065	2.2	28
Conway, S. C.	5,066	4.0	1
East Moline, Ill.	12,359	1.2	8
Elmhurst, Ill.	15,458	1.8	24
Galesburg, Ill.	28,876	1.9	37
Joliet, Ill.	42,365	1.3	8
Maywood, Ill.	26,648	1.2	17
Colorado Springs, Colo.	36,789	2.6	37
Kansas City, Mo.	634,093	1.0	180†
Aurora, Ill.	47,170	1.2	10
Total	927,905	...	404

*Six years. †Nine years.

for a period of ten years in communities whose drinking water contains less than 1 p.p.m. of fluorine. These figures were obtained partly from the U. S. Public Health Service and partly by questionnaire. In a total population of 12,427,512, there were reported 9,174 cases of poliomyelitis, or seventy-four cases per 100,000.

Table 3 shows the population and the total number of cases of poliomyelitis for a period of ten years in communities whose drinking water contains 1 p.p.m. and over of fluorine. In a total population of 927,905, there were reported 404 cases of poliomyelitis, or forty-four per 100,000.

Communities with 1 p.p.m. or over

of fluorine in their water show thirty per 100,000 fewer cases (45 per cent) of poliomyelitis than those having less than 1 p.p.m. of fluorine in their water supplies.

It will be interesting to observe if fewer cases of poliomyelitis will appear in those communities that are now adding 1 p.p.m. of fluorine to their potable water for testing possibilities in the control of dental caries.—*3619 Rosedale Road.*

TOOTHBRUSHING HABITS OF 405 PERSONS

Hamilton B. G. Robinson, D.D.S., Columbus, Ohio*

Introduction and Purpose

Information concerning the method employed in brushing the teeth, the number of strokes used for each area of the mouth and the time consumed in brushing should be of value to the periodontist and other members of the dental profession.

Periodontists have recognized the importance of proper brushing in maintaining oral health and in preventing certain traumatic lesions which may be initiated by improper brushing habits. Generally, it has been recommended that the teeth be brushed for three minutes at each brushing, but Hirschfeld[1] objected to this. He maintained that a person may brush a "favored" area for two minutes and devote only one minute to the rest of the mouth. Hirschfeld, therefore, recommended that twelve areas be brushed for ten strokes each. Data on the present brushing methods should offer useful information on the effectiveness of educational methods used to influence brushing habits and to show the changes necessary to correct present faults.

The production of abrasion of the hard tissue of the teeth depends, in part, on the number of strokes used in brushing. If one can ascertain the number of strokes required to produce defects under laboratory conditions and data are available on the number of strokes used by the average person at each mouth toilet, the relative tendency of a given dentifrice to produce abrasion can be estimated.

The following study was designed to supply data on the brushing time and strokes of a representative group. Incidentally, the method of brushing and the type of dentifrice selected were recorded.

Method

A half-silvered mirror was built into a partition which divided a small room in half. It was possible, with proper lighting arrangements, to view a patient from one side of this mirror while the patient saw only his own reflection.

Clinic patients and students were invited to brush their teeth in front of the mirror with new brushes and choice of unlabeled powder, liquid or paste dentifrice. The only direction given was to "brush your teeth just as you would at home."

Sitting behind the mirror, concealed from the patient and, in most cases, unknown to the patient, the observer counted the number of strokes and re-

The work on which this paper is based was supported by a grant to Washington University by the Procter and Gamble Company, Cincinnati.

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1. Hirschfeld, Isador: Toothbrush—Its Use and Abuse. Brooklyn: Dental Items of Interest Publishing Co., 1939.

corded the time consumed in brushing and the type of dentifrice and brushing method. Two multiple laboratory counters with five keys each, such as are used in hematologic work, were used to record the number of strokes for five maxillary regions and five mandibular regions (anterior, right and left bicuspid and right and left molar). The totals were calculated for the maxillary area, the mandibular area, the posterior areas (bicuspid plus molar) and the entire mouth.

Methods of brushing were recorded as cross-wise, rotary, vertical, occlusal and indeterminate.

It was impossible, under the conditions, to separate labial (and buccal) from lingual and occlusal brushing, except in those persons who brushed only the occlusal surfaces. However, the brushing was almost entirely confined to labial (and buccal) regions. For those persons brushing for extremely long periods, some lingual and occlusal brushing was noted.

A stroke was recorded for each excursion of the brush across the surface of a tooth; that is, the forward and the backward motions were recorded as two strokes.

Thirty-five persons repeated the brushing, and the data procured were used as a check for the method.

Data

The 405 persons studied included 320 men and eighty-five women. The average age was 22 years. Of this group, ninety-seven were dental students, eight were dentists and nine were employees of the school. The remaining 296 were clinic patients.

The average time used for brushing was one minute and seven seconds (sixty-seven seconds). The average number of strokes was 267.1, with 122.8 used for the maxillary teeth and 144.3 for the mandibular teeth. The lowest number of strokes used was forty (by a 55-year-old woman with a complete dentition of natural and artificial teeth). The greatest number of strokes was 798 (by a 22-year-old man). Figure 1 shows the distribution of the 405 persons according to the number of strokes used. It can be

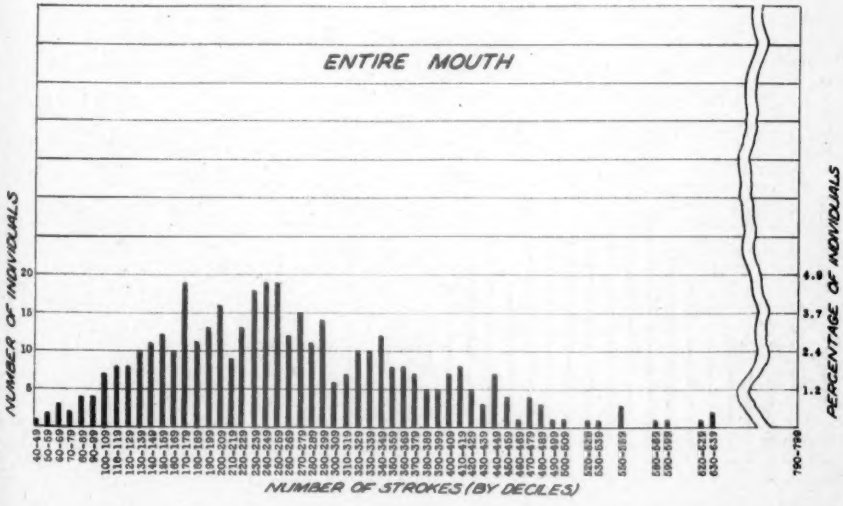

Fig. 1.—Number of strokes used by 405 persons in brushing the teeth.

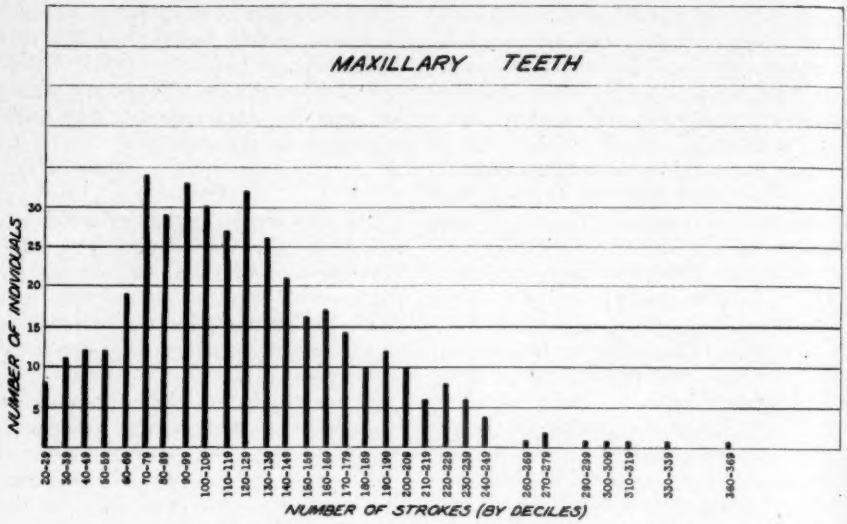

Fig. 2.—Number of strokes used by 405 persons in brushing the maxillary teeth.

seen that less than ten persons used a number below the decile 130-139 or above 340-349. The data for each of the ten regions and for the maxillary and mandibular arches can be seen in the accompanying table. Figures 2 and 3 give the distribution of brushing strokes for the maxilla and the mandible, and

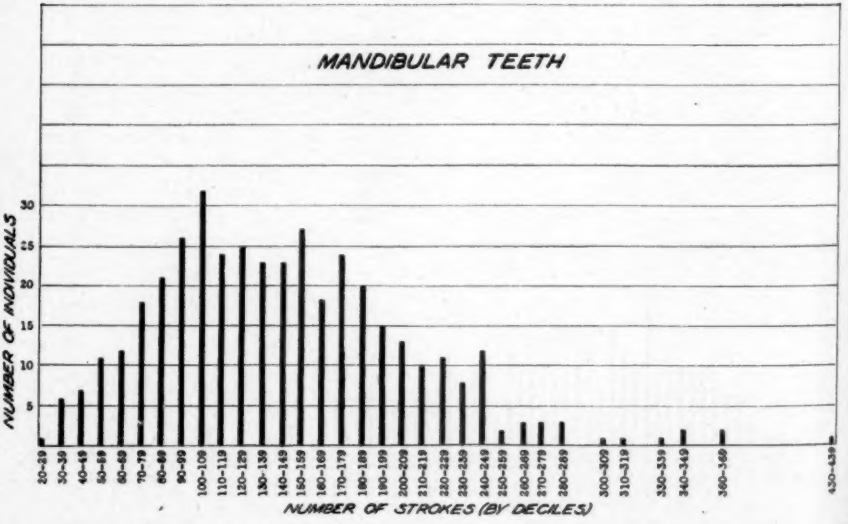

Fig. 3.—Number of strokes used by 405 persons in brushing the mandibular teeth.

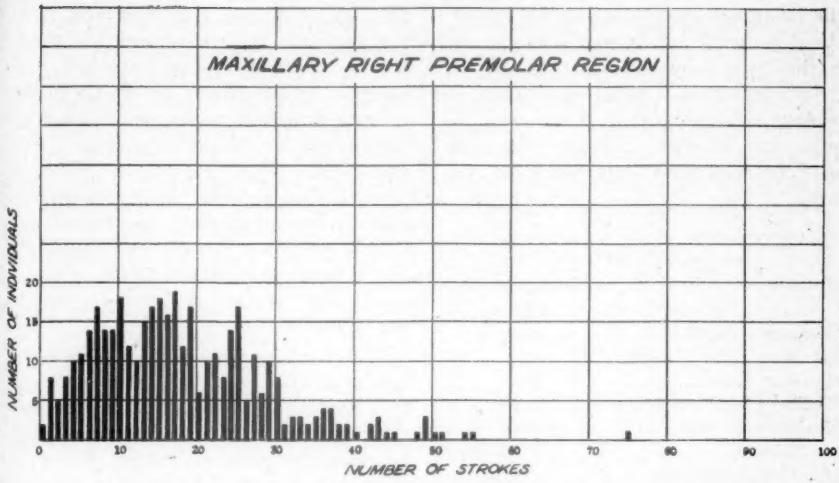

Fig. 4.—Number of strokes used by 405 persons in brushing the maxillary right bicuspid area (area receiving lowest average number of strokes).

Figures 4 and 5 give the distribution of strokes for the maxillary right bicuspid area and for the mandibular right molar area.

Thirty-five persons who performed the test twice (440 total counts being made) used an average of 272.8 strokes on the first trial and 277.4 on the second trial.

Of the 405 persons, 153 used a rotary method of brushing, 146 a crosswise and ninety-seven a vertical. In seven instances

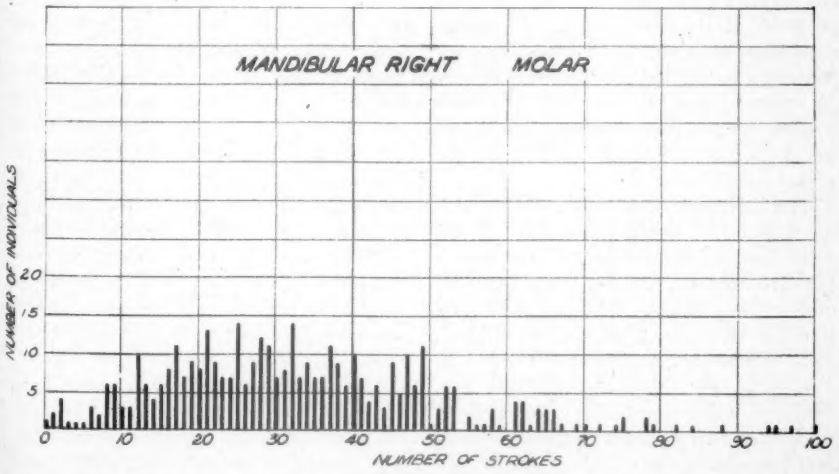

Fig. 5.—Number of strokes used by 405 persons in brushing the mandibular right molar region (region receiving highest average number of strokes).

the brushing was exclusively on the occlusal surfaces, and in two instances the method was indeterminate.

In 276 instances, paste was chosen; in seventy-five, powder; in forty-seven, liquid, and in seven instances the teeth were brushed with only water on the brush.

Distribution of the Strokes Used in Brushing the Teeth

Area	Average Number of Strokes
Maxillary right molar	29.2
Maxillary right bicuspid	17.7
Maxillary front	28.0
Maxillary left bicuspid	21.3
Maxillary left molar	26.4
Subtotal	122.8
Mandibular right molar	33.1
Mandibular right bicuspid	22.0
Mandibular front	31.9
Mandibular left bicuspid	25.0
Mandibular left molar	32.1
Subtotal	144.3
Total	267.1

Discussion

The group studied included clinic patients, dental students and a few school employees and dentists. Because an army program at the University was sending a number of trainees to the clinic, we secured a young age group (average age, 22 years) and a majority of men (79 per cent). This condition should not in any way affect the validity of the report.

The average time consumed (sixty-seven seconds) is about one-third of the recommended three minutes. Twenty-six persons used only fifteen to thirty seconds. These persons used the following number of strokes: 44, 57, 60, 65, 69, 71, 75, 80, 87, 99, 99, 106, 112, 112, 119, 121, 125, 128, 143, 146, 149, 152, 156, 159, 171 and 171. Nineteen persons took from two minutes to three minutes and forty-six seconds. These persons used the following number of strokes: 283, 327, 348, 350, 393, 401, 411, 415, 425, 436, 481, 508, 552, 552, 559, 598, 632, 647 and 798. It is apparent that there is a general correlation between time and number of strokes but that there is a variation in the number of strokes that any person may make in a given time. The person who brushed the shortest time (fifteen seconds) used seventy-five strokes (five per second), and the person who brushed the longest time (226 seconds) used 559 strokes (four per second). The average number of strokes per second was 4.7.

The average number of strokes used was 267.1. Of these strokes, 144.3 were used in the mandible and 122.8 in the maxilla. Each of the regions received the following number of strokes in order from the greatest to the least:

Mandibular right molar	33.1
Mandibular left molar	32.1
Mandibular anterior	31.9
Maxillary right molar	29.2
Maxillary anterior	28.0
Maxillary left molar	26.4
Mandibular left bicuspid	25.0
Mandibular right bicuspid	22.0
Maxillary left bicuspid	21.3
Maxillary right bicuspid	17.7

Exclusive of the anterior area, the left side received an average of three more strokes than the right. No effort was made to record the number of right-handed or left-handed persons. If we accept Hirschfeld's recommendation[1] of ten strokes per area, the amount of brushing is much greater than the need, although the time of brushing is much less than that generally recommended.

From these data, we cannot ascertain the number of strokes used on any given tooth. For instance, in any given mouth the maxillary right cuspid may receive only the strokes recorded for the bicuspid area (average, 17.7), only those recorded for the anterior area (average, 28.0) or some combination. Therefore, the average for the maxillary right cuspid falls between 17.7 and 45.7 strokes per brushing. Distribution graphs (Figs.

4 and 5) are given for the regions receiving the lowest and the highest average number of strokes.

Thirty-four of the thirty-five persons repeating the brushing were dental students. They used five more strokes than the entire average on the first trial and an additional five strokes on the second trial. These figures indicate that the dental students in the group did not appreciably raise the average of the entire group and that the data are reproducible with relatively small error.

The type of brushing used is interesting. In 153 instances (37 per cent), the recommended rotary method of brushing was used, and an additional ninety-seven persons (24 per cent) used the approved vertical method. In 146 instances (36 per cent), the crosswise method, universally condemned, was used. Very few persons brushed any surfaces other than the labial and the buccal. The occlusal surfaces were given a few sweeps, and the lingual surfaces were barely touched. However, seven persons brushed only the occlusal surfaces and such portions of the other surfaces as were reached incidentally.

The choice of dentifrice probably is in large part influenced by advertising. In this study, no brand choice was possible, but the influence of advertising on the type of dentifrice chosen was evident. The choice was overwhelming for paste, with powder and liquid dentifrices following in that order.

Summary

1. A group of 405 persons were studied to ascertain brushing habits.

2. The average number of strokes used in brushing the teeth was 267.1.

3. The average length of time spent in brushing the teeth was sixty-seven seconds.

4. Of the 405 persons, 37 per cent used the rotary method of brushing, 24 per cent used the vertical method and 36 per cent used the crosswise method.

5. Paste was chosen by 276, powder by seventy-five, liquid by forty-seven and water by seven.

6. The results were duplicated within an average of five strokes on thirty-five persons reexamined.—*College of Dentistry, Ohio State University.*

THERMAL CONTROL APPARATUS FOR DENTAL DRILLING

Leon Lieber, D.M.D., Kelly Field, Texas*

Seldom, except in dentistry, are revolving or cutting instruments generally used without a fluid lubricant. Until comparatively recently, there has been no suitable apparatus for effectively cooling, lubricating and preventing the clogging of these instruments and carrying away the débris incident to their use.

Empirically, many careful operators found that they could reduce pain and speed operative work by playing a stream of water on the tooth. An assistant stood by with the water spray, which was applied as needed. This had the disadvantage of requiring the full time of an assistant. There was no synchronization of water flow with movement of revolving instrument. It was impossible, in most instances, to apply the stream at the exact point of instrument-tooth contact, and the volume of water and its flow were difficult to control.

In an effort to overcome some of these

*Captain (DC).

disadvantages, Hofschneider, of Rochester, patented a device which operated mechanically from a small reservoir hung on the armpiece. This delivered a constant volume of water, synchronized and directed at the point of contact. It had the disadvantage that the small reservoir often ran dry at a critical point in the work; the handpiece attachments were bulky and crude and, most important, there was no provision for bringing the water to a proper working temperature.

The thermal control apparatus described herein, patterned after the device developed by Chester J. Henschel, of New York, is in use by a widening group of progressive dentists. Dr. Henschel is allowing the armed forces the full use of his patents on the apparatus.

Theory Underlying Thermal Control

It has been shown[1] that the dentin of a vital tooth is very susceptible to sudden changes in temperature. The "thermal tolerance zone" of dentin is roughly 85° to 130° F. Any rapid change will normally elicit pain in proportion as the temperature rises above 130° F. or drops below 85° F.

In a comprehensive and exhaustive study,[2] Henschel showed that previous estimates of heat from revolving instruments were inaccurate because the measurements had been made at some distance from the origin of the heat; that is, the actual point of contact of the bur blade with the dentin. All of these previous measurements were well within the "thermal tolerance zone" of dentin, yet careful clinical observation over a period of years has shown that pain and pulp trauma are directly associated with frictional heat of substantial amount.

Working with a group of graduate dentists, Henschel showed that careful dry drilling with the smallest of burs will give a temperature rise of from 67 to 270 degrees F., well above the higher limit of thermal tolerance of the dentin. Under abuse or with larger instruments, temperature rises of 1,000 degrees F. can be demonstrated. In general, these findings have been corroborated by Australian research workers in independent investigations.[3]

The conclusion is obvious that all revolving dental cutting instruments should be used in conjunction with a stream of water calculated to keep the temperature at the point of contact within the thermal tolerance zone of the dentin. Mere moistening is insufficient since temperatures up to 212° F. may thus easily develop. In addition, the bur will become clogged. With the use of the thermal control apparatus, the temperature rise can be kept below 15 degrees F.

Description of Apparatus

Essentially, the apparatus (Fig. 1) consists of an electrically operated valve, which controls the flow of water, a reservoir where the water is heated and a universal handpiece and contra-angle attachments directing the stream on the working edge of the revolving instruments.

The water supply may come from a liter bottle (*A*) hung high enough for gravity feed and connected with rubber tubing; or it may come from the regular water supply by cutting into one of the water feeds to the dental unit with copper tubing. The water is led to a valve (*B*) activated by a solenoid (*C*). The electric leads from the solenoid are connected parallel with the dental engine. When the current goes on, the magnetic field lifts the plunger from its seat, allowing the water to flow. When off, the plunger drops back into place, immediately cutting off the water flow. This

1. Henschel, C. J.: Pain Control by Cold Control. D. Digest 47:444, October 1941.

2. Henschel, C. J.: Heat Impact of Revolving Instruments on Vital Dentine Tubules. J. D. Res. 22:323, August 1943.

3. Willis, H. E., and Warner, H. K.: Heat Generated in Cavity Preparation. Austral. J. Den. 44:62, February 1940.

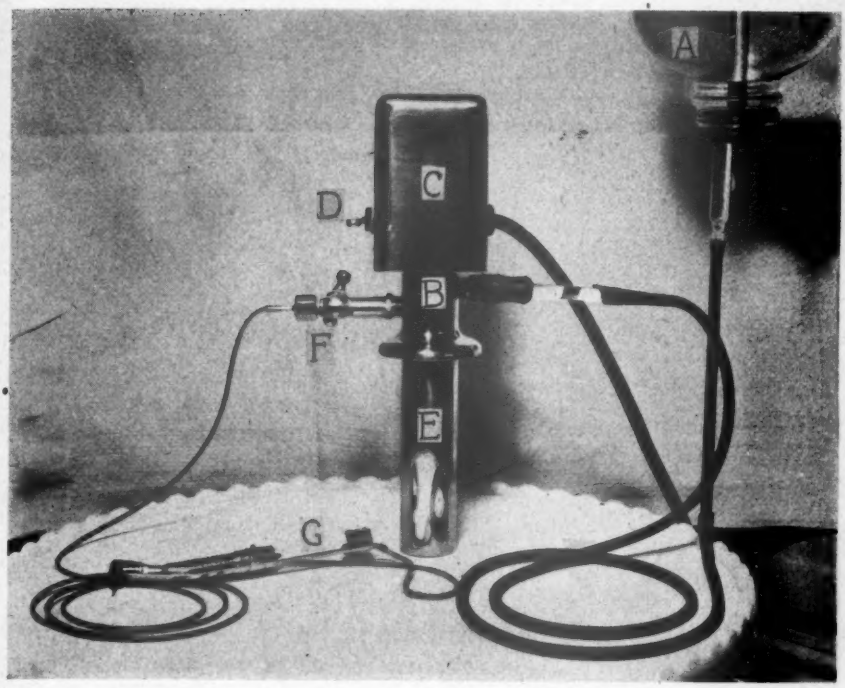

Fig. 1.—Thermal control apparatus for dental drilling.

provides perfect synchronization of the water flow with the engine operation. A cut-off switch (*D*) in the circuit allows the valve to remain inactive if desired.

The solenoid valve is set over a small reservoir tank (*E*) built to fit into the spray bottle heater well on the dental unit. The supply of water delivered by the solenoid-operated valve is brought to the bottom of the tank through a tube. Here, it is heated and drawn off at the top of the reservoir to a needle valve control (*F*). This adjustment is hand operated and controls pressure and volume. Once adjusted, it requires little attention.

One-eighth inch rubber or plastic tubing conveys the water to the handpiece or contra-angle attachment (*G*). This allows quick delivery from reservoir to bur with little change in temperature. The heater should be adjusted so that the temperature of the water at the bur is about 100° F.

The handpiece and contra-angle attachments are constructed of flattened metal tubing, closely adapted and firmly attached by means of clips. When they are properly constructed, the slight added thickness is hardly noticeable in handling the instrument. A tiny outlet at the working end delivers a fine stream of water directly at the point of instrument-tooth contact. (Fig. 2.) The needle valve should be adjusted to deliver approximately 8 cc. of water per minute.

A pyrex test tube half full of mineral oil may be set in the second spray bottle well. Immediately on completion of the operation, the one-eighth inch tubing is disconnected and the contra-angle and

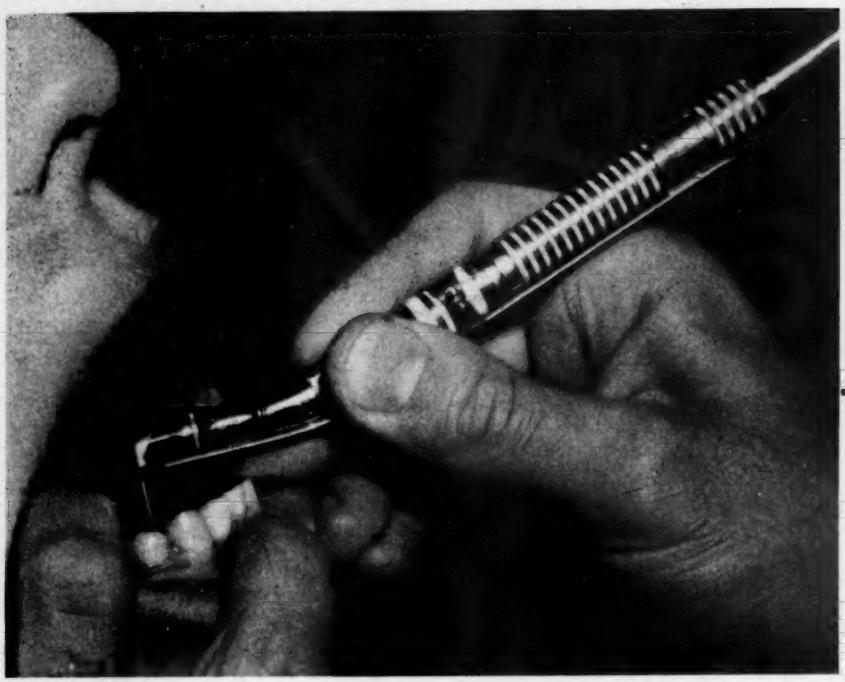

Fig. 2.—Outlet which delivers stream of water directly to point of contact.

attachment are placed in the mineral oil. The heater thermostat, set above the boiling point of water, but below that of the mineral oil, will drive out all moisture and air and the oil will flow into all the working parts without dismounting. This method of handling contra-angles, which has been used for many years, has given satisfaction in long trouble-free use of the contra-angle. The metal tubing attachment, once adjusted, need never be removed from the contra-angle.

The ejection of water from the mouth may be accomplished with the standard saliva ejector, or a piece of tubing to replace it, shaped with a horizontal section extending to the molar region. I prefer to have the patient expectorate, providing a short break in the otherwise continuous drilling.

Advantages of Use

1. More than 50 per cent of patients experience no pain. Approximately 25 per cent have some pain, but are comfortable. Some will be found so sensitive that use of anesthesia is warranted. When this is required, the operator still has all the other advantages of thermal control. In a great many of the sensitive cases, when the area is comparatively small, as in Class 5 cavities, the excavation can be completed so rapidly that it is over before the patient realizes that there has been any pain.

2. Rapidity of excavation is limited only by the speed of the motor and cutting quality of the instrument used. Increase of operative speed for careful operators of from 300 to 500 per cent is not unusual. The cutting instrument is applied with little or no intermission.

There is a total over-all saving in time for the operator and a shorter "tension period" for the patient.

3. The hot, dry sensation usually associated with dental operative procedures is eliminated and the vibration is cushioned by the water and the rapidity of revolution. Many patients are more concerned over vibration than over actual pain.

4. The bur blades and pores of carborundum and diamond stones never clog and are always sharp and clean. This accounts in great measure for the increase in operative speed.

5. The life of burs and stones is greatly prolonged. Unclogging operations, which usually dull blades, are unnecessary, and thus time is saved. Burs and stones will cut fairly well under a stream of water even if they are entirely unsatisfactory when dry.

6. The cavity is clear of accumulated débris at all times and visibility may be enhanced by the magnifying effect of the meniscus of clear water. The presence of a whipped-up froth of tooth powder, air and moisture is eliminated.

7. Removal of old fillings, particularly amalgam alloy, is extremely rapid in contrast with usual methods. The amalgam fairly melts away without any clogging of the bur.

8. The need of anesthesia to control pain due to heat production is eliminated. With or without anesthesia, protection of the pulp from operative thermal trauma is complete and absolute.

9. At best, dental procedures are a necessary evil, nerve wracking and morale depressing. Word soon spreads of the tangible evidence of the use of the latest developments in dentistry and their concomitant benefits. Cooperation of the patient is enhanced, and the effect upon the general morale of troops cannot be measured.[4]

Some difficulty may be experienced by the operator in becoming adapted to the use of the apparatus, and it is well at first to assume no pain-reducing features and to operate intermittently as in the conventional dry state. New procedures require some concentration to become established, but the temporary inconvenience will prove well worth while. Experience has shown that every operative patient will prefer, and in private practice most will demand, the use of thermal control, once they have experienced it.*—*Kelly Field.*

4. Air Technical Service Command Public Relations Office: Is That My Tooth You're Drilling? Hygeia 23:275, April 1945.

*The apparatus pictured was manufactured by the Maintenance Division of Kelly Field. Blueprints, further information and permission to copy these units for armed forces use may be obtained on request to the writer.

ABSENTEEISM IN TENNESSEE INDUSTRIAL PLANTS CAUSED BY DISEASES OF THE TEETH AND GUMS

Ruth R. Puffer, D. P. H., and Carl L. Sebelius,† D.D.S., M.P.H., Nashville, Tenn.*

In the development of industrial medical programs basic data are needed for determining and measuring the health problems. To prevent and control illness and injury it is necessary to know when, where and under what conditions illness and injury occur. In industry an unusual opportunity is provided for the collection of data regarding disabling illness and injury through routine recording of the causes and duration of absences from work. From the analyses of the causes of absences, the health problems may be defined and sound industrial health measures established for improving the health of workers.

In order to render assistance in industrial health programs, the Tennessee Department of Public Health has been carrying on a study of absences in certain industrial plants in Tennessee. These analyses are of value in two ways. First, they provide information regarding the absentee problem in each plant for improving the health program of that plant. Second, they provide statistics regarding illness and injury of industrial workers which may be used for comparisons and as a basis for building industrial health programs. The value of such vital statistics was discussed at a recent symposium of the Industrial Hygiene Section of the American Public Health Association.[1] It is important that data collected on absenteeism be used constructively for improving the health of workers. These data need to be studied as carefully as mortality statistics for determination of the health problems. As a result of these analyses control programs should be developed in the fields in which methods of prevention are known and are available.

For the absentee study of the Tennessee Department of Public Health, absences of one calendar day or longer are reported routinely by the participating plants. The reasons for all absences and the causes of illness and injury are given. For classification of causes of illness, the *Manual for Coding Causes of Illness*[2] of the United States Public Health Service is used. Among these causes are illnesses attributed to infected teeth and gums (code number 510, *Manual*). The causes included under this code number are:

Abscess of gum or tooth	Periodontal cyst
Caries, dental	Periodontoclasia
Gingivitis	Pyorrhea (gum) (alveolaris)
Impaction, tooth	Ulcer, gum
Infection of gum or tooth	

Thus, through this study data are available regarding absences that resulted from illnesses caused by diseases of the teeth and gums.

In the preparation of annual reports of the plants participating in this service, relatively high rates were noted for diseases of the teeth and gums. In fact, in one plant the absence rates for white

Acknowledgment is made of the valuable suggestions of Drs. W. M. Gafafer and L. D. Heacock, United States Public Health Service.

*Director of Statistical Service, Tennessee Department of Public Health.

†Director of Dental Hygiene Service, Tennessee Department of Public Health.

1. Puffer, R. R.: Uses and Value of Industrial Vital Statistics. Am. J. Pub. Health 35: 553, June 1945.

2. U. S. Public Health Service: Manual for Coding Causes of Illness.—Washington: U. S. Government Printing Office, 1944.

men and women employees were considerably higher than the comparable rates for employees of a public utility. Since relatively high rates also were observed in the other plants, this analysis of absences attributable to dental diseases in the plants was prepared. The only known extensive published data regarding absences of one calendar day or longer are those for the public utility analyzed by Gafafer.[3,4] Through personal communications, Gafafer[5] and Bishop[6] supplied additional data regarding absences of one calendar day or longer caused by dental diseases. No similar published material concerning diseases of the teeth and gums is known. It is hoped that this analysis not only will provide useful information for the evaluation of industrial dental health problems but also will serve as a stimulus to others to collect and analyze data requisite for establishing sound industrial health programs.

The present report is limited to the study of absences reported to be the result of illness caused by infected teeth and gums. It does not include absences said to be necessitated by visits to the dentists for dental care. Thus, only dental illnesses serious enough to cause an absence from work of one calendar day or longer were used.

Also, this report includes only illnesses definitely attributable to diseases of the teeth and gums. It is known that diseases and conditions classed under other title numbers of the classification may be the result of diseases of dental origin. In discussing the extent of dental diseases at the recent hearings regarding the bills on dental research and dental care, the Surgeon General[7] of the United States Public Health Service said, "Dental diseases are among the most common of human ailments. Almost all the population is afflicted with them, and they often induce a train of related maladies. . . . Neglected, untreated, diseased teeth and gums may be the direct or indirect cause of many other maladies, including toothache, acute dental abscesses and focal infections with resulting arthritis, neuritis, neuralgia, valvular heart disease, disease of the kidneys and the gastrointestinal tract." In addition to the absences and time lost reported here, infected teeth may have been the direct or indirect cause of other absences or of impairment of the health of the employee while at work.

Analysis of Data

The total population of the four Tennessee plants participating in this study for the year 1944-1945 was 5,988, of which 3,512 were white men and 2,107 were white women. As the colored population was small (369), the rates are not presented by sex for the colored employees.

In order to compare the experience in the Tennessee plants with those in other areas, Gafafer[5] supplied data for the public utility with an average annual population of 2,423 white men and 554 white women for the five-year period 1940-1944, inclusive, and for a steel mill with a population of 2,746 for the period July 1940-June 1941. Bishop,[6] of the Tennessee Valley Authority, provided data for a North Alabama plant employing an average of 2,987 persons during the calendar year 1943.

3. Gafafer, W. M., and Sitgreaves, R.: The Age Factor in Disabling Morbidity, 1940-1944, Experience in a Public Utility Company. Pub. Health Rep. 60: 1447, December 7, 1945 (includes references to ten previous papers in the series).

4. Gafafer, W. M.: Manual of Industrial Hygiene. Philadelphia: W. B. Saunders Co., 1943.

5. Gafafer, W. M.: Personal communication to the author.

6. Bishop, E. L.: Personal communication to the author.

7. Hearings before a Subcommittee of the Committee on Education and Labor, United States Senate, on S. 190 and S. 1099, Dental Research and Dental Care. Washington: U S. Government Printing Office, 1945.

Table 1.—Annual Absence Rates, Based on One Calendar Day or Longer, per 1,000 Employees, by Color and Sex

	Total	White Men	White Women	Colored
Total, Tennessee Plants, 1944-1945	47.3	33.0	64.5	84.0
Plant A	67.6	37.0	64.5	170.7
Plant B	57.4	50.6	66.7	27.8
Plant C	39.2	28.8	59.1	36.1
Plant D	98.0	47.6	109.6	125.0
Public Utility,[5] 1940-1944	—	19.5	46.5	—*
Steel Mill,[5] 1940-1941	—	20.0	—	—
North Alabama Plant,[6] 1943	94.1	80.4	121.5	122.1
Company H, Industrial Hygiene Foundation,[8] 1943	—	42.6	65.5	—

In the analysis of absences caused by dental diseases, the experience as measured by the three rates of considerable importance in the study of absenteeism, namely, frequency, disability and severity, was as follows:

Frequency Rates.—Frequency rates, the average annual numbers of absences per 1,000 employees, for the four Tennessee plants are presented in Table 1 and Figure 1. Comparative data for the public utility, steel mill, North Alabama plant and Member Company H of Industrial Hygiene Foundation[8] also are given.

During the year 1944-1945, 283 absences that were the result of diseases of the teeth and gums were reported in the Tennessee plants and the absence rate was 47.3 per 1,000 employees. The absence rate for white women of 64.5 per 1,000 employees was nearly two

8. Gafafer, W. M.: Sick Absenteeism Among a Sample of Member Companies of Industrial Hygiene Foundation, 1943 and 1942. Proc. Indust. Hyg. Foundation, Pittsburgh, November 15-16, 1944.

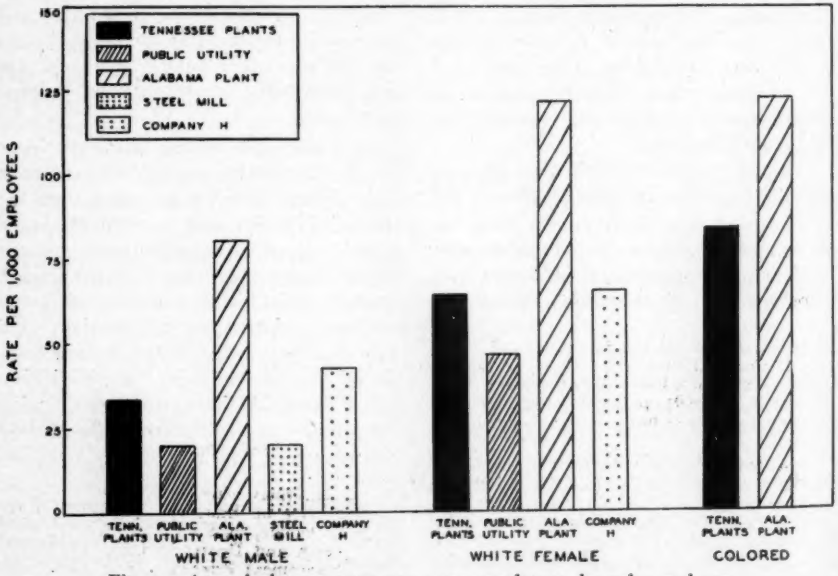

Fig. 1.—Annual absence rates per 1,000 employees, by color and sex.

Table 2.—Annual Number of Calendar Days Lost per Employee, by Color and Sex

	Total	White Men	White Women	Colored
Total, Tennessee Plants, 1944-1945	0.210	0.175	0.257	0.266
Plant A	0.395	0.385	0.183	0.585
Plant B	0.228	0.233	0.221	0.250
Plant C	0.182	0.133	0.287	0.077
Plant D	0.118	0.048	0.137	0.125
Public Utility,[5] 1940-1944	—	0.057	0.130	—
Steel Mill,[5] 1940-1941	—	0.064	—	—
North Alabama Plant,[6] 1943	0.238	0.190	0.219	0.374

times the rate of 33.0 for white men. Although frequency rates for women for all illnesses and injuries are usually higher than the rates for men, the cause of the higher absence rates from diseases of the teeth and gums is not readily apparent. The absence rate of 84.0 per 1,000 colored employees was higher than the rates for white employees.

The rate of 33.0 per 1,000 employees for white men in the Tennessee experience was higher than the rates for white men in the public utility and in the steel mill; however, it was lower than the rates for the North Alabama plant and for Member Company H of the Industrial Hygiene Foundation. Although the rate of 64.5 for white women in the Tennessee plants was higher than the rate for the public utility, it was practically the same as for Company H and it was lower than the rate for the North Alabama plant. The relatively high frequency rates for the North Alabama plant may result in part from the inclusion of a few absences of less than one day's duration. In an ordnance plant[5] in which absences of one-half day or longer were reported, the frequency rate was 89.7 for white men and 291.9 for white women. Thus, these rates which include one-half day absences are high. In general it may be said that the Tennessee plants compared unfavorably with the public utility, with higher rates noted for each Tennessee plant.

Disability Rates.—In addition to frequency rates, disability rates, or annual numbers of days lost per employee, are valuable in the study of absenteeism attributable to dental diseases. The days lost per employee in the Tennessee plants, in the public utility, in the steel mill and in the North Alabama plant are given in Table 2 and are shown graphically in Figure 2.

During the year 1944-1945, 1,255 days were lost by employees in the Tennessee plants as a result of illnesses caused by diseases of the teeth and gums. The disability rate was 0.210 days per employee. The disability rate for white men was more than three times the rate for the public utility and the rate for white women was nearly two times the comparable rate for the public utility. The Tennessee disability rates, however, differed only slightly from those in the North Alabama plant.

Severity Rates.—The severity rate, the number of days lost per absence, is of special interest in this study of dental diseases. The average length of these absences in Tennessee plants was 4.4 days. This figure indicates that all of these absences were not caused by minor illnesses but that many of the illnesses were disabling for a considerable period of time. Of the 283 absences beginning in this period, 34 (12 per cent) lasted 8 days or longer. Although some of the absences were of 1 day's duration and were caused by toothache, others, for example, were caused by infected and impacted teeth which necessitated extractions and were followed by a period of illness. The average length of absences was greater in the Tennessee

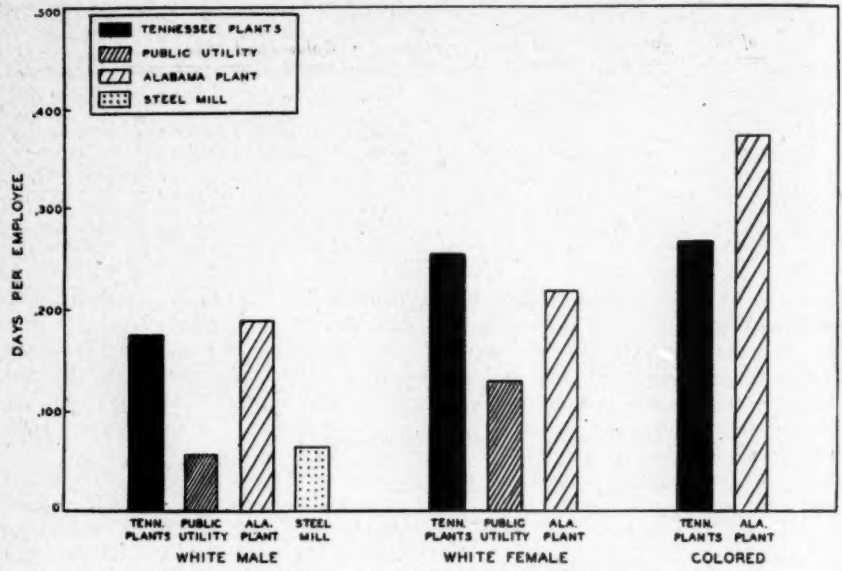

Fig. 2.—Annual number of days lost per employee, by color and sex.

experience than in the public utility, steel mill or North Alabama plant (Table 3).

Absences Lasting Eight Days or Longer.—In many studies of absenteeism,[9, 10] absences from illness and non-industrial injury lasting 8 days or longer have been used. These absences were used because of the availability of data through sick benefit associations, company relief departments and group insurance plans. Since the number of reported absences of 8 days or longer attributable to diseases of the teeth and gums is relatively small, these absences are included under "other digestive diseases." Long-time absences as a result of dental diseases, however, do occur and it is important to know the frequency and the disability caused by serious illnesses resulting from pathosis of the tissues and structures found in the oral cavity.

In the Tennessee experience, 34 ab-

9. Gafafer, W. M.: Sickness Indemnification. Proc. Indust. Hyg. Foundation, Pittsburgh, November 15-16, 1944.

10. Gafafer, W. M.: Sickness Absenteeism Among Male and Female Industrial Workers During 1944, and Among Males During the First Quarter of 1945, with a Note on Absence Duration, 1941-1944. Pub. Health Rep. 60: 1043, September 7, 1945.

Table 3.—Average Number of Calendar Days per Absence, with Color and Sex of Employee

	Total	White Men	White Women	Colored
Total, Tennessee Plants, 1944-1945	4.43	5.31	3.98	3.16
Plant A	5.83	10.40	2.83	3.43
Plant B	3.97	4.60	3.31	9.00
Plant C	4.64	4.64	4.85	2.14
Plant D	1.20	1.00	1.25	1.00
Public Utility,[5] 1940-1944	—	2.93	2.78	—
Steel Mill,[5] 1940-1941	—	3.20	—	—
North Alabama Plant,[6] 1943	2.53	2.37	1.80	3.07

sences that were caused by diseases of the teeth and gums and lasted 8 days or longer were reported for the second year of participation, 1944-1945. The frequency rate for these absences was 5.7 per 1,000 employees; the disability rate, 0.107 days per employee; and the severity rate, 18.9 days. Recently Heacock[11] reported that in an industry that employed over half a million workers the frequency rate for absences of 8 days or longer was 0.8 per 1,000 employees. The average duration of these absences was 27 days. From the comparison of the Tennessee experience with that of the large industry reported by Heacock, it is evident that many more serious illnesses attributable to dental diseases were reported in Tennessee than in this other experience.

In discussing the situation in the large industry, the medical consultant stated to Heacock that the figures were far from complete, chiefly for the reason that the majority of disabilities from pathologic conditions of the teeth or gums were of short duration. To quote Heacock, "He also said that in comparing this frequency rate of 0.8 per 1,000 male workers with other rates in this industry, the rate for dental disability was almost on a parity with that for tuberculosis, and this being the case, it seemed odd that we should spend thousands of dollars for the prevention of tuberculosis and pennies for dental prophylaxis."

Most of the absences of 8 days or longer result from the removal of impacted teeth or the extraction of infected teeth with hard or soft tissue involvement which resulted because of lack of dental care. In order to reduce absences of dental origin, more consideration must be directed toward improvement of dental health. In addition, it is desirable to improve the dental health of workers not sick enough to be absent from work but who have become less efficient and partially sick as a result of a diseased condition of dental origin.

The public utility used in the comparisons is located in a city in New England in an area where the dental caries experience differs from that in Tennessee and Alabama and where dental care is probably more readily available for the population. Since this public utility provides a valuable experience of absences of 1 calendar day or longer for comparisons, it is important to understand the differences existing in these two sections of the country in regard to dental problems.

In New England the dental caries rate is reported to be considerably higher than in the South. The DMF (decayed, missing or filled) permanent teeth rate for Tennessee of 3.20 per white United States naval recruit during 1934 was roughly only one-fourth the rate (12.20) for the state in which the public utility is located.[12] The 3.20 DMF rate compares favorably with the 3.6 DMF rate reported by Sebelius[13] for 211 white students 15 to 17 years of age. However, more recent dental examinations made by members of the Dental Hygiene Service of students in the same age group (15 to 17 years) revealed a rate of 6.7 DMF permanent teeth per person.

In 1943, members of the Dental Service of the Tennessee Department of Public Health made dental examinations for 1,021 white workers in five industrial plants in Tennessee. The DMF permanent tooth rate per person for these workers was 5.5, 7.4, 11.9 and 14.1, respectively, for the following age groups: less than 20 years, 21 to 30 years, 31 to 40 years and 41 to 50 years. When dealing with individuals more than 30 years

11. Heacock, L. D.: The Place of Dentistry in Industrial Health Program. Indust. Med. 12:672, October 1943.

12. East, B. R.: Some Epidemiological Aspects of Tooth Decay. Am. J. Pub. Health 32: 1242, November 1942.

13 Sebelius, C. L.: Variations in Dental Caries Rates Among White and Negro Children. J.A.D.A. 31:544, April 1, 1944.

of age, however, one finds that the DMF rate has much less significance as a caries experience rate, since a portion of the teeth have been lost because of periodontal disturbances rather than by dental caries. An average of 6 permanent teeth per person were indicated for extraction or already had been lost in the age group of 31 to 40 years, a group which was found to have a DMF rate of 11.9 permanent teeth per person, or it may be stated that one-half of the decayed, missing or filled permanent teeth already were missing or were indicated for extraction.

From Selective Service data[14] of registrants examined for military service, there is evidence that Tennessee did not compare unfavorably with other states in prevalence of dental defects. Based on major defect or principal cause of rejection, it is estimated that dental defects were responsible for the rejection of 9.9 per cent of the first 2,000,000 men examined in the United States. The standards for examinations at that time were those used before they were lowered and corrections were made after induction. Those standards which required a minimum of 3 serviceable natural masticating teeth above and 3 below opposing and 3 serviceable natural incisors above and 3 below opposing were not considered high by dental authorities. In all, the minimum requirement consisted of a total of 6 masticating teeth and 6 incisors. Thus by these standards, only 12 teeth out of the usual 32 were necessary, provided they were in the right places. In the study of results of examinations in Tennessee the major defect or principal cause of rejection was not given preference[15]; instead the prevalence of disqualifying dental defects was obtained. In the examination of 47,880 registrants in Tennessee, 7.0 per cent were found to have dental defects which would disqualify them for general service. Thus, the data indicate that disqualifying dental defects were not found as frequently in Tennessee as in other sections of the country.

The higher absence rate for colored employees than for white employees warrants consideration in relation to the dental caries experience and dental care.

In a comparative analysis of the dental conditions among white and colored children aged 3 to 17 years, in twenty-four counties in Tennessee, it was found that significant variations in the dental caries rates existed between the white and colored children.[13] The white children were found to have the highest total caries experience, and the colored children with a lower dental caries experience were found to have lost more permanent teeth than the white children and to have practically no evidence of previous dental care. No doubt, the higher lost tooth rate can be explained by the difficulties that many of the colored children must overcome in order to receive dental care, since oftentimes there are no dental facilities available in the community.

In a study of results of dental examinations of 1,908 white and colored men at the Ohio State Reformatory,[16] although the white population was found to have received relatively more dental treatment than the colored, the white population continued to be in need of more treatment.

Dental Care

In Tennessee, the dental care available for the correction of defects is less than in some other sections of the coun-

14. Analysis of Reports of Physical Examination, Medical Statistics Bulletin, No. 1, National Headquarters, Selective Service System, Washington, 1941.

15. Fenn, J. W.; Shull, H. J.; Williams, W. C., and Puffer, R. R.: Selective Service Registrants in Tennessee Qualified for Limited Military Service. J.A.M.A. 119:1115, August 1, 1942.

16. Gafafer, W. M., and Messner, C. T.: Results of a Dental Examination of 1,908 White and Colored Males at the Ohio State Reformatory. Pub. Health Rep. 51:321, March 27, 1936.

try. In 1940, in the East South Central States, which include Tennessee, there were 2,662 dentists or 1 dentist per 4,780 population; in New England, however, there were 5,038 dentists or 1 dentist per 1,674 population.[17] Thus, there were nearly three times as many dentists per 1,000,000 population in New England as per 1,000,000 population in this area.

According to the Tennessee Directory of Dentists, in Tennessee on November 1, 1942, there was 1 dentist per 3,932 population. The available service for the colored population was limited, with only 75 colored dentists or 1 per 6,885 people. The dental service rendered to the population of Tennessee and especially to the colored population is probably far less than that rendered in New England. Also, throughout Tennessee the dental manpower shortage is so acute that the appointment books are oftentimes filled several months in advance and many of the dentists have been forced to do an emergency type of practice rather than give their patients complete dental care.

Comments

These observations indicate that the dental caries rate in Tennessee is relatively low and that dental care is limited, especially in rural areas, while in industry the absence rates as a result of dental diseases are relatively high. It is believed that this condition in industrial workers is the result of an accumulation of dental defects without corrections, with the additional possibility of toxic exposures in the working environment.

It is hoped that, by a presentation of data on absenteeism of dental origin among industrial workers, industry as well as the members of the dental profession may realize that absence rates for diseases of a dental nature are relatively high and that there is a need for dental health service in industry of the type recommended by the Industrial Committee of the Council on Dental Health of the American Dental Association.[18]

Hooper[19] called attention to the lack of data on dental absenteeism and emphasized its importance. The relationship of the health program to absenteeism was reported by Kulstad[20]: "Whenever a complete health service, dental and medical, exists in an industry, conclusive proof is available to show that, by controlling dental infection, a material reduction in all lost time results." The value of a dental service to industry also was discussed by Dunning[21] and by Thomas.[22] There is also a need for all dentists to realize more than ever before the importance of the preventive approach in the practice of their profession.

The relatively high absence rates for diseases of the teeth and gums, in the study of absenteeism in Tennessee plants, are indicative of a dental problem in the adult population. This situation warrants investigation and an understanding of the conditions which limit dental service. Such an investigation may serve in the development of a more complete industrial health program.

Recommendations

If there is to be an improvement in the dental health status of industrial workers and a lowering of absenteeism

17. O'Rourke, J. T.: An Analysis of the Number of Active Dentists in the United States. J.A.D.A. 31:1097, August 1944.

18. Industrial Dental Committee, Council on Dental Health, American Dental Association. Proc. Indust. Den. Committees, Chicago, February 17-18, 1944.

19. Hooper, H. A.: Dental Ill-Health in Relation to Absenteeism. Indust. Med. 12:3, January 1943.

20. Kulstad, H. M.: The Place of Dentistry in Industry. Indust. Med. 14:234, March 1945.

21. Dunning, J. M.: Your Teeth and Your Job. Indust. Med. 14:318, April 1945.

22. Thomas, E. H.: Mouth Infection and Industrial Health. Indust. Med. 13:901, November 1944.

attributable to diseases of the teeth and gums, it seems important that special attention should be given to the following:

1. As a result of this investigation and others, it seems that more complete fact-finding surveys should be conducted so that better data on absenteeism as a result of diseases of dental origin can be obtained and effectively used to show the need for industrial dental service in many plants.

2. In 1944, the Industrial Committee of the Council on Dental Health, American Dental Association,[18] defined industrial dentistry as that specialty of dentistry which is concerned with the dental health of the industrial worker as it affects or is affected by his general health and his working environment. This definition is well-worded and needs wide use so that there will be a better agreement as to what industrial dentistry actually is.

3. Heacock[23] recently said, "Dental services in an industrial plant should correspond to those rendered by the medical services, and the findings and treatment should be closely integrated with those affecting the general health of the individual.

"These services should be:

1. Preplacement and periodic oral examination and diagnosis of all employees.

2. Emergency treatment, including the treatment of occupational injuries and disease.

3. Treatment and eradication of oral sepsis.

4. Adequate recording of findings and recommendations.

5. Education in dental health and follow-up of individuals to encourage complete and regular dental service."

These recommendations as to minimum dental health service, which have been made by the Industrial Dental Committee of the Council on Dental Health of the American Dental Association,[18] if followed by industry, should decrease absenteeism and promote better dental health.

4. Preplacement dental examinations in industry might well assist in the promotion of better dental health conditions and less absenteeism. Heacock[23] stated that preplacement examinations serve as a base-line of the employee's dental health from which deviations can be recorded and evaluations made at the time of the periodic examination. They also serve as an educational procedure and employees can be advised of conditions that need correction and urged to have the corrections made.

5. Also, because of the dental manpower shortage, most dentists should consider the more effective utilization of auxiliary dental personnel and dental operation units for additional production.

23. Heacock, L. D.: Prevention of Oral Diseases of Occupational Origin. Presented at the Regional Government Industrial Hygiene Conference, Philadelphia, September 25-26, 1945.

Summary

Through the study of absenteeism being carried on by the Tennessee Department of Public Health, data regarding absences attributable to diseases of the teeth and gums are available for use in developing sound industrial dental health programs.

During the second year of participation of Tennessee plants the frequency rate for absences of 1 calendar day or longer as a result of diseases of the teeth and gums was 47.3 per 1,000 employees and the disability rate was 0.210 days per employee. The severity rate of 4.4 days per absence indicated that many of these absences were caused by serious illnesses that resulted from dental conditions.

Comparisons with other experiences indicated that the rates for Tennessee were relatively higher than those for the public utility and were similar to those for a North Alabama plant.

The rate for absences lasting 8 days

or longer of 5.7 per 1,000 employees was evidence that serious illnesses are due to dental causes.

From surveys made on the dental caries rates in the United States, Tennessee seems to have a much lower rate than most of the northern states and certain other sections of the country. Data are limited, however, regarding the number of teeth lost in adults as a result of diseases of the investing tissues.

In a study of the distribution of dentists, the East South Central States, which include Tennessee, were found to have fewer dentists per population than any other region in the entire United States.

It is hoped that this analysis will provide information for evaluating industrial dental health problems and will serve as a stimulus to others to collect and analyze data for establishing sound industrial dental health programs.—*Tennessee Department of Public Health.*

THE COLD SLAB IN SILICATE CEMENT RESTORATIONS

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The preservation of the natural teeth in good condition as long as possible has become common. Therefore, it is not astonishing that, from the time of the invention of silicate cements to the present day, the profession has expected much from them.

Silicate cements have damaged the pulp and sooner or later dissolved. Therefore, many practitioners have stopped using them and have returned to the use of more durable materials such as metals and porcelain. When a new silicate cement comes on the market, it is tried and is found to be at first quite epoch-making but later the newcomer falls into oblivion. However, the producers of silicate cements have worked indefatigably to produce a material which would have all the required qualities of a filling material. Thus the number of the producers of cements has grown considerably.

As the manufacture of silicate cements may frequently be by trial and error, it is easily understood that some products change in quality from time to time. When the experimentation produces a reasonably satisfactory cement, the same recipe is used as long as the profession appears satisfied. These products are usually under supervision of the official establishments for research, so that the fit and the unfit products can be known to the practitioners. To this day silicate cement has not reached perfection, and so the improvements go on. The silicate cements should be considered to be semipermanent filling materials.

The cements are chemical compounds in which a solid cement powder, in joining with a liquid, changes to new chemical compounds and the mixture hardens. The chemical phenomena are complicated and not well understood. In the hardening of a cement, one can see two principal changes: the initial setting and the subsequent hardening. The hardening continues for a long period; for example, portland cement continues to harden for years.

Setting and hardening phenomena are very important practically. The time of setting is important in judging the usefulness of a cement. If the setting is too quick, it is impossible to make a restoration of the cement without disturbing its firmness, for the disturbance of the ce-

ment during setting lowers its quality. If, on the contrary, the setting is too slow, it is difficult to wait long enough for the hardening of the filling, and if the filling becomes wet before the setting is finished, the surface will be damaged. A proper speed of setting is one long enough to manipulate the cement just for as long a time as is needed for the filling, after which time the cement should set promptly.

The setting time is characteristic in every cement. It is a known fact that a silicate cement in which the water content of the liquid is great, is more quick setting. In addition to that, the powder-liquid ratio influences the setting: the more powder used in a given quantity of liquid, the quicker the cement sets. The manner of the mixing causes very little difference in setting time. If we mix the powder in the liquid in very small portions, the mixing procedure will therefore be prolonged and the setting time will be a little longer. Conversely, if we mix a larger amount of powder in the first portion, the setting will be a little quicker. The temperature in which the mixing and setting occur has the greatest effect upon the setting time. A low temperature can prevent the setting and a high one accelerates it. Many of the producers of silicate cements recommend a cool slab for mixing. However, the temperature of the slab should not fall below the dewpoint, as water would collect on the surface of the slab. This is not at all desirable, for the slab must be clean and dry during the mixing of the cement. In winter, when it is easy to cool the slab, the danger of dampness is small because the relative humidity of the air in a warm room is low. In summer the relative humidity is higher and the dewpoint is lower. Therefore the slab cannot be cooled as much in summer as in winter in northern or colder climates.

The foregoing discussion is an introduction to the following brief investigation which aims to clear up one question about silicate cements.

Purpose of the Investigation

The purpose of this investigation is to answer the question: Is a cold slab advantageous in making silicate restorations?

For the experimentation two well-known silicate cements were selected. One is de Trey's Syntrex, a silicate cement used since 1905; the other is Jota-Werk's Diasilic, which also has been used for many years. According to the directions for using de Trey's cement, it is advised to mix on a slab at room temperature in the warm season. When the temperature of the room rises some degrees above normal, it is advised to cool the slab a little. In the directions for mixing Jota-Werk's Diasilic it is advised to mix always on a cold slab (10°-12° C.).

Method of Test

The strength of silicate cements has been determined mostly by means of the test for compressive strength. Formerly Dieck,[1] Paschke,[2] Weikart,[3] Nironen[4] and others investigated the transverse strength of silicate cements. In this investigation, also, the transverse strength test was used as in previous investigations by the author.[4,5] The surfaces of the test specimens were ground even. The test specimens were then measured and broken by applying the load at the center of the span and the transverse

1. Dieck, W.: Uber methodische Prüfung der Silikatzemente. Dtsch. Mschr. Zahnhk. 40:225, 1922.
2. Paschke, Heinz: Uber Silikatzemente. Zahnärztl. Rsch. 36:719, 1927.
3. Weikart, Paul: Beiträge zür Bestimmung der Festigkeit von Silikatzemente. Dtsch. Mschr. Zahnhk. 48:1280, 1930.
4. Nironen, Pekka: Tutkimusksia silikaattisementtien taivultuslujuudesta. Helsinki, 1939. Academic Dissertation.
5. Nironen, Pekka: Beiträge zur Kenntnis der Silikatzemente. Zahnärztl. Rsch. 50:1312, 1941.

strength was determined in kilograms per square centimeter (kg/cm²).

The cement was mixed with an agate spatula on a mixing slab known as Jota-Thermo-Anrührplatte (a flask slab containing a thermometer and filled with water). The mixing time was followed as exactly as possible. The mixing time of de Trey's Syntrex cement is, according to the instructions, 1¼-1½ minutes and that of Diasilic cement is 1 minute. Because the mixing must be done thoroughly it was necessary in some cases to extend these given times. Two test pieces were made from every mix. One of them was forced into the mold under pressure of a small glass plate. The other was made without pressure by modeling with a spatula in the mold. Before and after preparation of the filling, the mold was kept at a temperature of 28° C. Mixing and filling time was approximately 3 minutes.

The test piece was in the mold 8-14 minutes after the time of setting, when it was put in water for 24 hours, or until determinations of the transverse strength could be made. Room temperature during the testing was 16°-17° C. The temperature of the slab was the same in some experiments and in others the slab was cooled to nearly 0° C., so that most of these mixes were done on a slab at 2°-6° C. Only in a few cases was the temperature above or below these mean figures.

The slab temperatures were varied as widely as possible so as to magnify their effect.

Results of the Investigation

Thirty-six mixes were made of each cement, 18 on a slab at room temperature (16°-17° C.) and 18 on a cold slab (2°-6° C.). From each mix two specimens were made, there being in all 144 specimens upon which the transverse strength was determined. The data were collected in four series, each of which includes the values of the transverse strengths of 36 test specimens expressed in kilograms per square centimeter (kg/cm²). The arithmetical mean value of the series was determined, as well as the standard deviations and standard errors by means of probability calculus. All these data are shown in Tables 1 and 2.

Discussion of the Results

Table 1 shows that the difference between the maximum and minimum strengths is great. Former investigations show the same trend. Dieck (1922)[1] selected the maximum strengths from many tests, because he supposed some special, unaccountable error was causing the weaker results. Paschke (1927)[2] published the maximum and the mean value of six experiments and here, too, the difference was large. Weikart (1930)[3] determined the increase in strength of silicate cements with time. He employed test pieces 1, 2, 3, 7 and 24 days old. He, like the two former investigators, used the values of the breaking load as relative values of the transverse strength and used the maximum values

Table 1.—Effect of the Temperatures of the Mixing Slab upon the Transverse Strength of Silicate Cements

Trade Brand Name of Cement	Temperature of the Mixing Slab °C	Maximum kg/cm²	Minimum kg/cm²	Average Value kg/cm²	Standard Deviation kg/cm²	Standard Error kg/cm²
de Trey's	16—17	278.0	170.2	211.9	22.5	3.75
Syntrex	2— 6	249.1	118.6	176.7	35.6	5.93
Jota-Werk's	16—17	181.4	121.1	147.7	14.8	2.47
Diasilic	2— 6	265.4	161.6	197.0	24.3	4.05

and an average value of 3 to 10 trials. He considered the latter better. Because Weikart used only a few tests he got a peculiar irregular curve which shows a great variation of test results. Instead of a strength curve, a variation in the compressive strength of silicate cements is noted as determined at the National Bureau of Standards (Paffenbarger, Schoonover and Souder 1938).[6] These investigators took the mean value of five specimens. If the values of the strength of more than two specimens from a series of five differed more than 15 per cent under the average, the test was repeated and a new average was calculated. The report did not mention how many of the tests were discarded, but a footnote to one table stated that one mean value, an exception, was an average of only two specimens. Also the author's former investigations of the transverse strength show a similar variation in all 27 test series.

Therefore, the great variation of the results can be considered characteristic of cements. This makes it necessary to use a large test series. With the aid of probability calculus it is possible to determine reliable values with a shorter series of tests. Accordingly, the mean value (M) of the standard deviation (σ) and standard error (Σ) were calculated (Tables 1 and 2). Two-thirds of the values in some series fall into limits $M \pm \sigma$, 95.4 per cent into limits $M \pm 2\sigma$, and 99.7 per cent into limits $M \pm 3\sigma$, if the series were continued. Probably the values of the mean would be within limits $M \pm \Sigma (M)$.

An examination of the conformity of the series by means of standard error of difference (Σ (M-M')) shows the first and second series in both groups to be different series without conformity. In the Syntrex series the difference of the mean values is greater than three times the value of standard error of difference ($35.2 > 3x\ 7.01$), and likewise, in the Diasilic series ($49.3 > 3x\ 4.74$). In both groups these series cannot be united in one series, but must be examined as independent series.

A comparison of different values (Table 1) shows Syntrex cement mixed at room temperature to be considerably stronger than Diasilic cement. However, when a cold slab was used, this is reversed and Diasilic is the stronger. Diener (1928)[7] asserted that the quality of silicate cements becomes better as more powder is incorporated into the liquid and this is done by cooling the slab to as low a temperature as possible. Diener's assertion is true for Diasilic cement but not true for Syntrex cement. A cement can be mixed to too thick a consistency.

In the beginning the properties were mentioned which speed the setting: a thick consistency and a high temperature. Syntrex cement mixed on a cold slab probably becomes too thick. As the cement reaches the temperature of the tooth, the setting hastens so much that the filling will not be as successful as is the case in which the mixing temperature is higher and the consistency of the mix respectively thinner. The maximum value in the second Syntrex series (Table 1) shows that a satisfactory mix can be prepared on a cold slab. But the mean strength value (M) = 176.7, and the deviation (σ) = 35.6 show the uncertainty.

As mentioned before, some test pieces were prepared with pressure and others without pressure, that is, only by modeling in the mold. The original series was divided into two series according to the method of preparation of the specimens, that is, whether the specimens were or were not subjected to pressure during setting. The mean values, standard de-

6. Paffenbarger, G. C.; Schoonover, I. C., and Souder, Wilmer: Dental Silicate Cements: Physical and Chemical Properties and a Specification. J.A.D.A. 25:32, January 1938.

7. Diener, Ad.: Die neue Silikattechnik für Aufhauten, Kronen u. Brücken. Zahnarztl. Rsch. 37:1040, 1928.

Table 2.—A Comparison of the Transverse Strengths of Silicate Cements When Specimens Were Made with and Without Pressure

Trade Brand Name of Cement	Temperature of the Mixing Slab °C	Specimens Made Without Pressure			Specimens Made With Pressure		
		Average Value (M_m)	Standard Deviation ($\sigma(M_m)$)	Standard Error ($\sigma(M_m)$)	Average Value (M_p)	Standard Deviation ($\sigma(M_p)$)	Standard Error ($\Sigma(M_p)$)
		kg/cm²	kg/cm²	kg/cm²	kg/cm²	kg/cm²	kg/cm²
de Trey's	16—17	210.1	25.0	5.89	213.8	19.6	4.62
Syntrex	2— 6	181.5	39.5	9.31	167.0	27.9	6.58
Jota-Werk's	16—17	149.9	15.1	3.57	145.6	14.2	3.34
Diasilic	2— 6	190.8	18.8	4.31	203.9	27.7	6.72

viations and standard errors were calculated and the data are arranged in Table 2.

A comparison of the mean values M_m and M_p of these series (Table 2) shows all of them to be rather equal excepting those in the second series (2°-6° C.) of the Syntrex group, of which $M_p = 167.0$ is considerably lower than $M_m = 181.5$. This makes it evident that this cement, when mixed on a cold slab, becomes too thick or sets too fast, because the pressure causes weakening. A similar observation was made in former investigations.[4] In the same series (Table 2) the Diasilic group has a mean value (M_p) of 203.9, which is higher than M_m (190.8). In the preparation of the test pieces of Diasilic cement it was observed that the excess was not squeezed out by pressing the cement in the mold. Its surface simply became even. Internal motions do not occur therein and do not decrease the strength as mentioned before.[5]

The standard deviations and standard errors shown in the 16°-17° C. series are smaller than in the 2°-6° C. series. According to the standard error of difference, a good conformity is to be observed in the former series ($\Sigma(213.8\text{-}210.1) = 7.49 > 3.7$ and $\Sigma(149.9\text{-}145.6) = 4.89 > 4.3$); and in the latter series the conformity is satisfactory ($\Sigma(181.5\text{-}167.0) = 11.40 < 19.5$ and $\Sigma(203.9\text{-}190.8) = 7.98 < 13.1$). Therefore, it was decided to use both series M_m and M_p (Table 2) as one test series as given in Table 1.

Conclusion

This investigation shows that cooling the mixing slab to 2°-6° C. causes Syntrex cement to have a lower transverse strength than when the temperature of the slab is 16°-17° C.

Diasilic cement on the contrary becomes stronger when it is mixed on a cold slab.—*Uudenmaankatu 7.*

DENTAL CARIES (DMF) EXPERIENCE IN RELOCATED CHILDREN EXPOSED TO WATER CONTAINING FLUORINE. II

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Purpose of Study

The following study compares the amount of new caries developing in permanent teeth present in the mouth at the beginning of exposure to water containing fluorine with the amount of new caries developing in permanent teeth erupting during the period of exposure. It is based on seriatim dental examinations of 316 children of Japanese ancestry transferred late in 1942 from their homes in the city of Los Angeles and environs to War Relocation Centers in California and Arizona. The examinations were made with the aid of dental mirrors and explorers in the early summer of 1943, approximately six months after the arrival of the children at the Centers, and again two years later, in the early summer of 1945.†

The 196 boys and girls residing at the California Center from 1943 to 1945 consumed water containing only 0.1 part per million of fluorine (a value within the error of determination). In contrast, the 120 children residing at the Arizona Center over the same time interval consumed water containing fluorine to the extent of 3 parts per million.

In a preceding report,[1] it was shown that new caries attack in the two-year interval from 1943 to 1945 among children who were 8-10 years old in 1943 was approximately 60 per cent lower in the fluoride area than in the control area. Children of those ages were protected more in the subsequent two-year interval than were children who were 12-14 years of age at the beginning of exposure. From this finding, the conclusion was derived that, among all caries-free teeth present in the mouth when exposure to fluorine is begun, the more recent the eruption the greater is the protection against caries.

It is the purpose of the present report to examine the effect of the presence of trace amounts of fluorine in drinking water on the incidence of new caries in those individual teeth which have the highest caries susceptibility, namely, the first and second molars and the second bicuspids,[2] and to differentiate between the caries-inhibiting effect of such waters on teeth (a) when already present in the mouth at the beginning of exposure and (b) not present in the mouth at the

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†The first examination findings in 1943 were made in the control locality by S. T. Ichiyasu and in the fluoride locality by T. T. Okuno. All the second examinations in 1945 were made by Toyohara Shimizu, Dental Officer, Office of Indian Affairs. The water samples were analyzed by Elias Elvove, Senior Chemist, U. S. Public Health Service. The kind assistance of Ralph B. Snavely, Medical Director, and Oskar Mickelsen, Dental Director, Office of Indian Affairs, is also acknowledged.

1. Klein, Henry: Dental Caries Experience in Relocated Children Exposed to Drinking Water Containing Fluorine. I. Incidence of New Caries After Two Years of Exposure Among Previously Caries-Free Permanent Teeth. Pub. Health Rep. 60:1462, December 7, 1945.

2. Klein, Henry, and Palmer, C. E.: Studies on Dental Caries. XII. Comparison of the Caries Susceptibility of the Various Morphological Types of Permanent Teeth. J. D. Res. 20:203, June 1941.

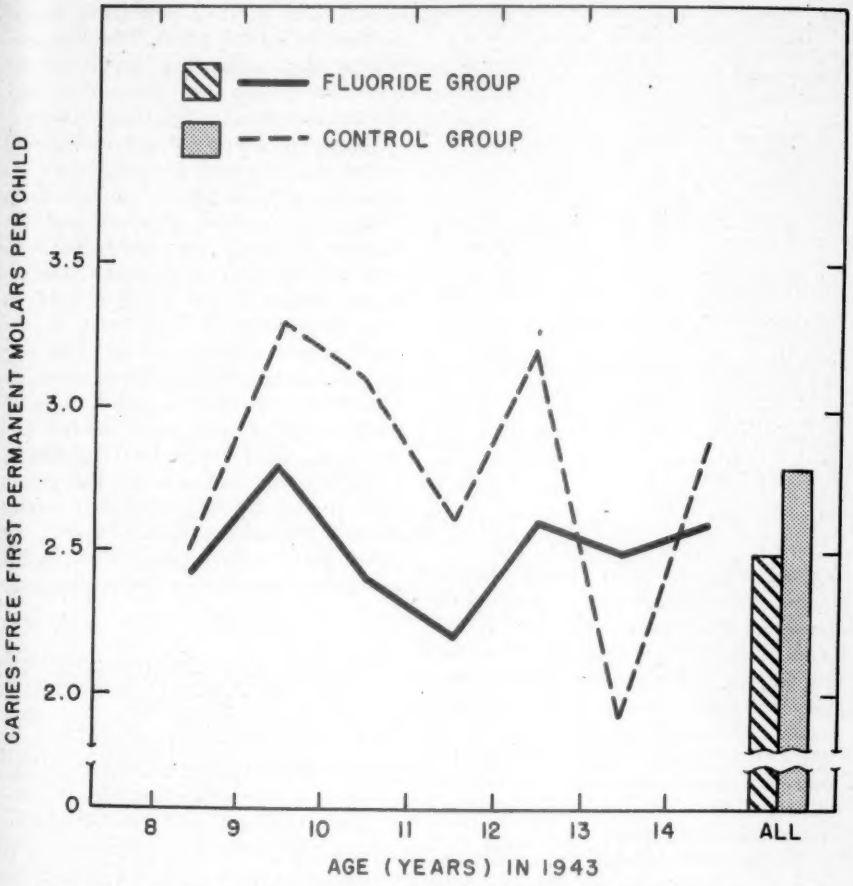

Fig. 1.—In the summer of 1943: Relation between age and number of caries-free permanent first molars per one hundred children of both sexes in the fluoride and control areas.

beginning but erupting into the mouth during that exposure.

Findings

Permanent First Molars.—At the first examination in May 1943, the two groups of children—those residing in the fluoride area and those living in the control area—differed only slightly with regard to caries experience. The children in the fluoride area averaged 2.5 caries-free first molars; those in the control area, 2.8 (Table 1 and Fig. 1).

Among children 8-10 years old in 1943 who had resided in the fluoride area for the next two years, 36 per cent of the first molars caries-free in 1943 had been attacked by 1945, as compared with 58 per cent in the area with fluoride-free water (Table 2 and Fig. 2). Among permanent first molars caries-free in 1943, the percentage difference in caries incidence during the next two years in the group exposed to fluorine, as con-

Table 1.--Erupted Permanent First Molars, 1943; Average Number of Caries-Free First Molars Among 316 Children Arranged by Age, Sex and Type of Water Consumed

Sex	Water*	Age in 1943 (Years)							
		8	9	10	11	12	13	14	All
		Number of Children							
Boys	Fluoride group	14	17	21	12	12	12	7	95
	Control group	4	10	4	10	8	6	10	52
Girls	Fluoride group	17	15	14	9	20	13	13	101
	Control Group	7	9	10	7	13	13	9	68
Both	Fluoride group	31	32	35	21	32	25	20	196
	Control group	11	19	14	17	21	19	19	120
		Number of Caries-Free First Molars Per Child							
Boys	Fluoride group	2.1	2.6	2.6	3.1	2.7	2.7	2.6	2.6†
	Control group	3.0	3.3	3.5	2.8	3.1	2.0	3.4	3.0†
Girls	Fluoride group	2.7	3.0	2.2	1.2	2.5	2.3	2.7	2.4†
	Control group	2.0	3.3	2.6	2.3	3.2	1.8	2.4	2.5†
Both‡	Fluoride group	2.4	2.8	2.4	2.2	2.6	2.5	2.6	2.5
	Control group	2.5	3.2	3.1	2.6	3.2	1.9	2.9	2.8

* The water at the Arizona Center contained 3 p.p.m. fluorine; that at the California Center was fluorine-free (based on single samples).
† Simple arithmetic average of seven age-specific rates.
‡ Simple arithmetic average of the sex-specific rates for each group.

trasted with the group using fluoride-free water, is greatest for children of the younger ages. Hence, among the children of both sexes who were 8-10 years old in 1943, those in the fluoride area developed only two-thirds as much new molar caries from 1943 to 1945 as did the control group, but, for children who were 12-14 years of age in 1943, no significant difference in caries incidence occurred for this tooth.

These findings indicate that first molars already present in the mouth of young children when fluorine exposure is begun obtain considerable protection against new caries. The recently erupted molars receive more protection than do first molars which have been in the mouth for longer periods.

Permanent Second Molars.—Table 3 shows the number of caries-free second molars present in the mouth at first examination and the number and percentage which showed evidence of caries attack two years later. For this tooth, data on children 12, 13 and 14 years old are available. The children of these ages of both sexes in the fluoride area had only 16 per cent of their previously caries-free second molars attacked by the summer of 1945, while those in the control area had 47 per cent attacked—a significant inhibition in the fluoride area.

Information on the number of second molars erupting into the mouth of children 12-14 years old in the two areas during the two-year exposure and the number and percentage which had been attacked by caries by the end of the exposure interval is also given in Table 3. Among children of both sexes in the fluoride area, about 4 per cent of the second molars erupting in the exposure interval were attacked by caries, whereas 26 per cent of such teeth showed evidence of caries attack by 1945 among children in the control area. From these data it may be concluded that second molars exposed to fluorine during the latter part of their calcification in the jaw before eruption or during the proc-

Table 2.--Erupted Permanent First Molars, 1943-1945; Number Caries-Free in 1943 and Number and Per Cent Showing Evidence of Caries Attack (DMF) by 1945, Among 316 Children Arranged by Age, Sex and Type of Water Consumed

Sex	Water*	Age in 1943 (Years)								
		8	9	10	8-10	11	12	13	14	12-14
		Number of Caries-Free First Molars in 1943								
Boys	Fluoride group	30	45	55	130	37	32	32	18	82
	Control group	12	33	14	59	28	25	12	34	71
Girls	Fluoride group	46	45	31	122	11	50	30	25	115
	Control group	14	30	26	70	16	41	24	22	87
Both	Fluoride group	76	90	86	252	48	82	62	53	197
	Control group	26	63	40	129	44	66	36	56	158
		Number of new DMF First Molars by 1945								
Boys	Fluoride group	11	14	24	49	13	13	6	9	28
	Control group	7	21	6	34	17	4	3	17	24
Girls	Fluoride group	13	18	11	42	3	19	6	15	40
	Control group	9	20	14	43	8	19	12	9	40
Both	Fluoride group	24	32	35	91	16	32	12	24	68
	Control group	16	41	20	77	25	23	15	26	64
		Per Cent of New DMF First Molars by 1945 Among First Molars Caries-Free in 1943								
Boys	Fluoride group	36.7	31.1	43.6	37.1†	35.1	40.6	18.8	50.0	36.5†
	Control group	58.3	63.6	42.9	54.9†	60.7	16.0	25.0	50.0	30.2†
Girls	Fluoride group	28.3	40.0	35.5	34.6†	27.3	38.0	20.0	42.9	33.6†
	Control group	64.3	66.7	53.8	61.6†	50.0	46.3	50.0	40.9	45.7†
Both‡	Fluoride group	32.5	35.6	39.6	35.9	31.2	39.3	19.4	46.8	36.1
	Control group	61.3	65.2	48.4	58.3	55.4	31.2	37.5	45.5	38.1

* The water at the Arizona Center contained 3 p.p.m. fluorine; that at the California Center was fluorine-free (based on single samples).
† Simple arithmetic average of appropriate three age-specific percentages.
‡ Simple arithmetic average of the sex-specific percentages for each age group.

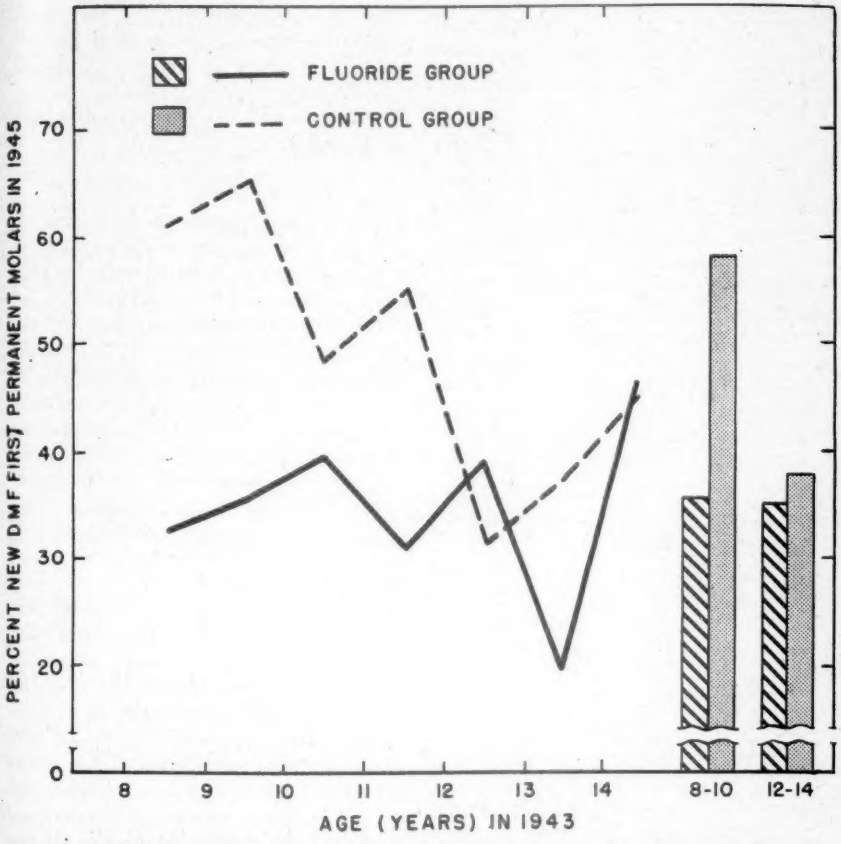

Fig. 2.—In the summer of 1945: Relationship between age in 1943 and percentage of new DMF permanent first molars among first molars caries-free in 1943 for children of both sexes in the fluoride and control areas.

ess of eruption into the mouth are protected more against caries attack than are second molars exposed to fluorine after eruption.

Permanent Second Bicuspids.—Table 4 provides data for children 12, 13 and 14 years old on the percentage of caries-free second bicuspids in the mouth in 1943 which were attacked by caries in the subsequent two-year interval. The incidence of new caries in second bicuspids among children of both sexes exposed to fluorine is approximately 7 per cent, as contrasted with 10 per cent for the control area, a difference which is of border-line significance.

Information on the number of second bicuspids erupting into the mouth during the two-year interval in both groups of children and the percentage of these attacked by caries is given in Table 4. Obviously, among children of the fluorine area, these teeth were exposed to fluorine before or during the process of

Table 3.--Permanent Second Molars, Erupted or Unerupted in 1943: Number and Per Cent Attacked by Caries (DMF) by 1945, Among 136 Children 12-14 Years of Age Arranged by Sex and Type of Water Consumed

Sex	Water*	Erupted Second Molars in 1943				Unerupted Second Molars in 1943			
		Age (Years)				Age (Years)			
		12	13	14	All	12	13	14	All
Boys	Fluoride group	3	23	15	41	22	22	12	56
	Control group	4	12	12	28	10	15	17	42
Girls	Fluoride group	8	4	44	56	41	26	8	85
	Control group	9	15	22	46	27	30	8	65
		Number of New DMF Second Molars by 1945				Number of New DMF Second Molars by 1945			
Boys	Fluoride group	0	4	3	7	0	0	1	1
	Control group	3	4	3	10	1	3	6	10
Girls	Fluoride group	1	1	9	11	4	1	0	5
	Control group	1	8	14	23	5	14	2	21
		Per Cent of New DMF Second Molars by 1945 Among Second Molars Caries-Free in 1943				Per Cent of New DMF Second Molars by 1945 Among Second Molars Unerupted in 1943			
Boys	Fluoride group	0.0	17.4	20.0	10.5†	0.0	0.0	8.3	2.0†
	Control group	75.0	33.3	25.0	44.4‡	10.0	20.0	35.3	21.8†
Girls	Fluoride group	12.5	25.0	20.5	19.3†	9.8	3.8	0.0	4.2†
	Control group	33.3	53.3	63.6	50.1‡	18.5	46.7	25.0	30.1†
Both‡	Fluoride group	6.3	21.2	20.3	15.9	4.9	1.4	4.2	3.5
	Control group	54.2	43.3	44.3	47.3	14.3	33.3	30.2	26.0

* The water at the Arizona Center contained 3 p.p.m. fluorine; that at the California Center was fluorine-free (based on single samples).
† Simple arithmetic average of appropriate three age-specific percentages.
‡ Simple arithmetic average of the sex-specific percentages for each age group.

Table 4.--Permanent Second Bicuspids, Erupted or Unerupted in 1943: Number and Per Cent Attacked by Caries (DMF) by 1945, Among 136 Children 12-14 Years of Age Arranged By Sex and Type of Water Consumed

Sex	Water*	Age (Years)				Age (Years)			
		12	13	14	All	12	13	14	All
		Number of Second Bicuspids Caries-Free in 1943				Number of Second Bicuspids Unerupted in 1943			
Boys	Fluoride group	21	27	14	62	26	18	14	48
	Control group	9	18	31	58	23	8	7	38
Girls	Fluoride group	26	37	40	103	53	13	8	74
	Control group	16	39	27	82	33	12	1	47
		Number of New DMF Second Bicuspids by 1945				Number of New DMF Second Bicuspids by 1945			
Boys	Fluoride group	2	2	1	5	1	0	0	1
	Control group	0	1	3	4	3	0	0	3
Girls	Fluoride group	2	0	3	5	0	0	0	0
	Control group	1	9	3	13	2	1	0	3
		Per Cent of New DMF Second Bicuspids by 1945 Among Second Bicuspids Caries-Free in 1943				Per Cent of New DMF Second Bicuspids by 1945 Among Second Bicuspids Unerupted in 1943			
Boys	Fluoride group	9.8	7.4	7.1	8.0†	3.8	0.0	0.0	1.3†
	Control group	0.0	6.7	9.7	5.5‡	13.0	0.0	0.0	4.3‡
Girls	Fluoride group	7.7	0.0	7.5	5.1†	0.0	0.0	0.0	0.0†
	Control group	6.3	23.1	11.1	15.5‡	6.1	7.7	0.0	4.8†
Both‡	Fluoride group	8.7	3.7	7.3	6.6	1.9	0.0	0.0	0.7
	Control group	3.2	14.9	10.4	9.5	9.6	3.9	0.0	4.5

* The water at the Arizona Center contained 3 p.p.m. fluorine; that at the California Center was fluorine-free (based on single samples).
† Simple arithmetic average of appropriate three age-specific percentages.
‡ Simple arithmetic average of the sex-specific percentages for each age group.

eruption. The findings for this tooth suggest that such exposure may provide a larger measure of protection against caries attack than is provided by exposure some time after eruption has been completed.

Discussion

The fluorine hypothesis in dental caries research has received considerable attention recently. Stated briefly,[3] it proposes that an inverse relation exists between dental caries susceptibility and the ingestion of trace amounts of fluorine. It has been suggested[4, 5] that fluorides be added to community water supplies—and such fluorination is now being done in at least two fairly large cities—with the aim of determining whether additions of fluoride to the drinking water consumed by a population not previously so exposed will inhibit new caries attack without toxic effects.

Arnold[6] has reported that fluorides exert their effect on reducing caries incidence only when taken in the diet while the teeth are developing in the jaw, and that little beneficial influence in that direction can be expected in persons who are more than 5 or 6 years of age at the time that fluorine ingestion is begun. On the other hand, other experience, particularly with topical application of fluorine solutions, suggests that teeth already erupted in the mouth may be protected against caries attack even though they

3. Klein, Henry, and Palmer, C. E.: Dental Caries in American Indian Children. Public Health Bulletin 239. Washington: U. S. Government Printing Office, 1937.

4. Ast, D. B.: Caries-Fluorine Hypothesis and Suggested Study to Test Its Application. Pub. Health Rep. 58:857, June 4, 1943.

5. Dean, H. T.: On the Epidemiology of Fluorine and Dental Caries. Fluorine in Dental Public Health: Symposium. New York: New York Institute of Clinical Oral Pathology, 1944.

6. Arnold, F. A.: Discussion of the Possibility of Reducing Dental Caries by Increasing Fluorine Ingestion. J. Am. Col. Den. 12:61, 1944.

are not exposed to fluorine during preeruptive development.[7-9] The findings of Weaver[10] are in agreement with this latter view, although he concludes that "the evidence obtained is on the whole in favor of the view that the influence of F is exerted on the teeth during the preeruptive period."

The observations recorded in the present report further support the fluorine hypothesis. The findings provide what may be considered a "pilot study" of some of the results in caries inhibition to be expected from fluorination of waters in communities previously not so exposed. Of particular interest is the finding that first and second molars and second bicuspids already erupted in the mouth are protected significantly against caries attack provided they become exposed to the fluorine-bearing waters within a short time after eruption.

The data on erupting second molars and second bicuspids, although few in number, suggest that teeth which go through the process of eruption during exposure to fluoride waters receive most protection against caries attack. This observation may be interpreted to indicate that the protective effect of fluorine is most marked if the tooth is exposed to this chemical either before eruption or during the time interval covered by the process of eruption of the tooth into the mouth.—*U. S. Public Health Service.*

7. Bibby, B. G.: Effects of Topical Application of Fluorides on Dental Caries. Fluorine in Dental Public Health: Symposium. New York: New York Institute of Clinical Oral Pathology, 1944.

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DENTAL STATUS OF 71,015 NAVAL PERSONNEL AT FIRST EXAMINATION IN 1942

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With the initiation of duplicate dental records in the Navy, a source of considerable material for statistical evaluation became available at the Bureau of Medicine and Surgery. In 1942 Capt. A. Knox,[1] then chief of the Dental Division, suggested that a study be undertaken to evaluate the dental status of a large number of naval personnel entering the service, in order to make a more accurate analysis of dental needs and to make known those problems in treatment confronting the Navy Dental Corps.

Other studies on the dental status of several different populations and employing various numbers of persons have been

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The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department.

1. Knox, A.: Personal communication to C. A. Schlack in 1942.

2. Hollander, F., and Dunning, J. M.: Study by Age and Sex of the Incidence of Dental Caries in Over 12,000 Persons. J. D. Res. 18:43, February 1939.

made. The largest number of persons studied was 12,000,[2] representing a cross-section of the population of New York. The Army Dental Corps conducted studies on some 7,000 aviation cadets using a DMF (decayed, missing and filled teeth) system of registration.[3] In the Navy a study covering 1,047 officers and enlisted men[4] was started by Capt. H. E. Harvey in 1939.[5] Another study included 359 naval personnel.[6] A study on a sample of 883 civilian students, whose average age fell within that of naval personnel, was made at the University of Pennsylvania.[7]

Other studies involved variables as to physical condition and method of examination and data recording, while those in the Navy represented an evaluation on screened personnel complying with certain physical standards, using more or less standard initial dental examinations. The army study most nearly approaches this one except for method of recording data and lack of evidence in the text that calculations for error at first examination had been made.

With dental records of such a large sample available for study (4.61 per cent of the total average naval strength in 1942 and 1943), efforts were directed toward the establishment of certain gross as well as detailed facts which would help the Dental Corps in a practical way. Among these data were contributions to more accurate budget estimates; time factors in the completion of the most pronounced needs of unit persons; location at birth of the most dentally defective persons; and trends in dental disease of the hard structures of that age group with which the Navy is particularly concerned.

Experimental Design and Procedure

A code was devised to register dental data on a punch card. Approximately 100,000 duplicate dental records were arranged in such a manner that transfer of data to a printed sheet matching a punch card designed for this purpose was effected more readily. Classes of dental officers, taking the indoctrination course at the Naval Dental School, were assigned regular periods to study the code and were then instructed to transfer the data from the dental records to the printed sheets. These sheets were sent to the Vital Statistics Division of the Bureau of Medicine and Surgery, where the data were further transferred to punch cards. The sorting machines were then used to summarize these data (see the accompanying chart). After 71,015 records were registered in this fashion, it was decided to group the data according to: (1) section of the country in which the men were born, (2) age groups and (3) age groups and section of the country combined.

In this first report, by the evaluation of the average dental treatments rendered in 1942 and 1943 (Table 1) and the average number of dental officers on duty during these two years (Table 2), an accurate estimate of the average dental treatment rendered by one dental officer per year was possible. It was felt that this method of measuring treatments rendered by one dental officer per year was more accurate than figures based upon time spent at the chair performing certain types of operations and treatments. All dental officers on duty were considered, including those engaged in admin-

3. Senn, W. W.: Incidence of Dental Caries Among Aviation Cadets. Mil. Surg. 93:461, December 1943.

4. Schlack, C. A.: Dental Caries: Prevalence Experience at Initial Examination and the Incidence of New Carious Lesions After a One-Year Interval in 1,047 Officers and Men of the United States Navy. U. S. Nav. M. Bul. 38:90, January 1940.

5. Harvey, H. E.: Personal communication to C. A. Schlack, July 14, 1939.

6. Rehrauer, W., and Berglund, K. V. L.: Dental Abnormalities in Recruits. U. S. Nav. M. Bul. 38:242, April 1940.

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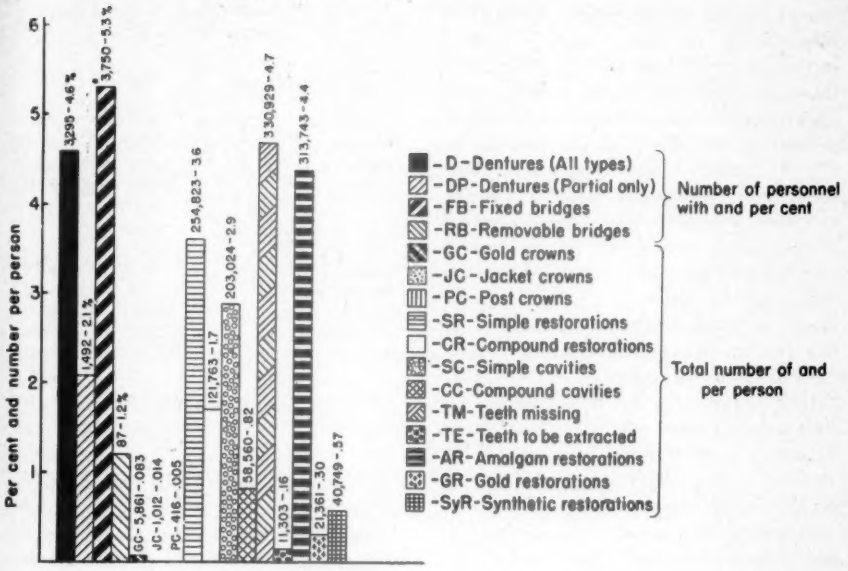
Per cent and number per person
6
5
4
3
2
1
3295 - 46 %
1,492 - 21 %
3,750 - 53 %
87 - 1.2 %
GC - 5,861 - .083
JC - 1,012 - .014
PC - 416 - .005
234,823 - 3.6
121,763 - 1.7
203,024 - 2.9
58,560 - .82
330,929 - 4.7
11,303 - .16
313,743 - 4.4
21,361 - .30
40,749 - .57
- D - Dentures (All types)
- DP - Dentures (Partial only)
- FB - Fixed bridges
- RB - Removable bridges
Number of personnel with and per cent
- GC - Gold crowns
- JC - Jacket crowns
- PC - Post crowns
- SR - Simple restorations
- CR - Compound restorations
- SC - Simple cavities
- CC - Compound cavities
- TM - Teeth missing
- TE - Teeth to be extracted
- AR - Amalgam restorations
- GR - Gold restorations
- SyR - Synthetic restorations
Total number of and per person

Dental status of 71,015 naval personnel (all ages and all regions) upon first examination in 1942, taken from records directly.

istrative or educational work only, those en route to a new station and those on leave. Time lost owing to battle action, inspections, illness, failures of patients to keep appointments, etc., was included in the compilation.

Since initial dental examinations are performed rather hastily under the pressure of large numbers of new personnel, many of the early carious lesions are not recorded. As treatment of these patients is undertaken by dental officers, a more thorough inspection can be made, but treatment rendered is recorded in another area on the dental chart. By the time that this is done, the duplicate record, containing the results of the initial examination, is on its way to the Bureau of Medicine and Surgery. Another reason that dental charts arriving in the Bureau do not contain a record of early caries is the fact that oral bitewing x-ray examinations (a better means of locating early dental caries) are not made in the Navy as a routine procedure. Only recently has this procedure been undertaken routinely on a large scale by the British for R. A. F. personnel.[8]

In order to arrive at an accurate estimate of the caries status at the initial examination, a correction factor had to be determined and applied to the simple and compound cavities recorded. This factor was found to be 2.75 on naval personnel. Calculation of this correction factor for the first dental examination was based upon the work of Rehrauer and Berglund[6] mainly, since their report involved a larger number of men than did the Dunning and Ferguson study.[9] Three hundred and fifty-nine naval per-

8. Harvey, W.: Scheme for Mass Dental Radiography of R.A.F. Air Crew on Entry by "Bite-Wing" X-Rays. Farborough, England: Flying Personnel Research Committee, Institute of Aviation Medicine, August 1945.

9. Dunning, J. M., and Ferguson, G. W.: Effect of Bite-Wing Roentgenograms on Navy Dental Examination Findings. U. S. Nav. M. Bul. 46:83, January 1946.

sonnel (mean age 19 years, 10 months) reexamined in the *U.S.S. Saratoga* showed 2,477 carious areas in addition to those shown on the dental records made approximately six months previously at shore stations. The examination in the *U.S.S. Saratoga* was made using bitewing roentgenograms and a doubly-checked, careful clinical examination. The original dental record showed an average of 3.95 carious areas per person. The second examination revealed an average of 6.89 additional carious areas per person. Thus, approximately 10.85 carious areas per person was the case, rather than 3.95 as recorded at the first examination. A correction factor of 2.75 was established using these data (10.85÷3.95). Dunning and Ferguson found similar errors when using bitewing roentgenograms and careful clinical examinations combined. Since both studies were made on naval personnel, and since there is a similarity in results, the figure 2.75 was taken as the correction factor to calculate a more real picture of caries at first examination in this study.

The average number of dental treatments in each category rendered by a dental officer per year was determined by dividing the average number of yearly treatments in each category, using annual treatment figures for 1942 and 1943 (Table 1), by the average number of dental officers on active duty in 1942 and 1943 (Table 2). The average number of restorations (fillings) placed by a dental officer per year determined in this fashion was used as the basis for computing dental officer man-years necessary to complete any given number of similar restorations (total number of restorations was chosen as the basis because restorations constitute the greatest single treatment item). Other dental treatments which could be accomplished would then be at the average rate shown in Table 1. If the average rate of accomplishing any treatment procedure, other than restorations (fillings), is to be increased for one reason or another, either the number of dental officers necessary would have to be increased or the average rate of other treatment procedures reduced.

*Table 2.—Dental Officers on Active Duty During 1942-1943**

Last Day of Month	1942	1943
January	857	2,560
February	871	2,695
March	954	2,868
April	1,020	3,019
May	1,124	3,171
June	1,263	3,339
July	1,379	3,621
August	1,528	3,810
September	1,738	3,988
October	1,842	4,107
November	2,232	4,309
December	2,283	4,451

*Average number of dental officers on active duty in 1942 and 1943, 2,459.54.

Attention is called to the fact that the figures cited in this report do not include dental treatment that becomes necessary in all categories with an increase in age. At present, there are no accurate data available to determine such rate of increase of dental treatment procedures in all categories in a very large sample of naval personnel. This is a problem for future study, when and if periodic bitewing x-ray examinations on the same person become an official, routine procedure.

Results and Comments

A study of these dental records showed an average of 3.72± simple and compound cavities per person at first examination in 1942. This figure corresponds favorably with that found by Rehrauer and Berglund (3.95)[6] and that of Dunning and Ferguson (3.6).[9] The total number of simple and compound cavities calculated to be present in 71,015 persons, by application of the correction factor of 2.75, was found to be 719,356.

Table 1.—Record of Dental Operations Performed on Naval Personnel, 1942-1943

Operation	Total Average, 1942-1943	Average Per Dental Officer*	Operation	Total Average, 1942-1943	Average Per Dental Officer*
Abscess, alveolar	21,013	8.54	Fractures, jaw	26,682	10.34
Abscess, incised	429	0.174	Gingival flaps, excised	5,300	2.15
Alveolectomy	11,163	4.53	Gingivectomy, pyorrhea	1,951	0.79
Anesthesia, general	9,867	4.01	Gingivitis	130,378	53.01
Anesthesia, regional	570,181	231.82	Gingivitis, Vincent's	294,196	119.61
Apicoectomy	3,473	1.41	Inlays, gold (not bridge abutments)	1,990	0.81
Apthae, treatment	529	0.21	Inlays, porcelain	701	0.285
Bridges	2,669	1.08	Intermediate bases	1,207,411	490.90
Bridges repaired	2,304	0.82	Necrosis, jaw	536	0.22
Calculus, submaxillary	10	0.004	Occlusion corrected	27,915	11.34
Cellulitis, incised and drained	474	0.38	Osteomyelitis, jaw	1,473	0.60
Crowns, acrylic	411	0.16	Papilloma, treatments	18	0.0073
Crowns, Davis	566	0.23	Paradentosis (pyorrhea)	31,670	12.87
Crowns, gold (not bridge abutments)	514	0.21	Pericoronitis	70,337	28.60
Crowns, jacket	1,102	0.45	Postoperative treatment	136,365	55.44
Crowns, porcelain, cast base	88	0.036	Pulpitis	10,917	4.43
Crowns, repaired	491	0.20	Pulps extirpated (teeth)	9,202	3.74
Curettage	24	0.0097	Recementing (crowns, bridges, inlays)	25,992	10.56
Cysts, excised	6,747	2.74	Root canal treatment	15,977	6.49
Dentures, full upper	7,950	3.23	Root canals filled (teeth)	9,876	3.98
Dentures, full lower	4,651	1.90	Sedative	192,351	78.20
Dentures, partial upper	8,294	3.37	Stomatitis	9,393	3.82
Dentures, partial lower	8,326	3.38	Surgical removal, foreign body	918	0.37
Dentures, adjusted	10,778	4.38	Surgical removal, residual roots	13,254	5.38
Dentures, reconstructed	3,225	1.31	Surgical removal, sequestrum	2,227	0.90
Dentures, repaired or rebased	12,025	4.89	Teeth removed, simple	581,366	236.37
Dislocations, mandible	24	0.009	Teeth removed, surgical	61,107	24.84
Epulis, excised	19	0.0077	Teeth removed, impacted	36,606	14.88
Fillings, amalgam, simple	4,175,243	1,697.57	Teeth removed, unerupted	4,230	1.72
Fillings, amalgam, compound	1,269,387	516.10	Miscellaneous	462,775	188.15
Fillings, gold foil	69	0.028			
Fillings, silicate cement	691,490	281.15			

*Average number of dental officers on duty during 1942-1943 combined, 2,459.54.

This figure multiplied by 42.24 (ratio of 71,015 to 3,000,000) yields a total of 30,385,597, the number of simple and compound cavities which could be expected in a 3,000,000 man Navy.

The average number of dental officers on active duty in 1942 and 1943 combined was 2,459.54, and these could accomplish 6,138,812 restorations per year (Table 1). Each dental officer could, therefore, place 2,495.92 restorations (fillings) of all kinds (including inlays, amalgam fillings and silicate cement fillings) per year.

If the total number of simple and compound cavities estimated to be present at first examination in 3,000,000 naval personnel (30,385,597) is divided by the number of cavities treated in a year by a single dental officer (2,495.92), it be-

comes evident that 12,174± dental officers working a year would be necessary to treat the simple and compound cavities in a 3,000,000 man Navy if other treatments, at the average rate shown in Table 1, were also carried out.

According to these calculations, 10.13 simple and compound cavities per person were found in a 71,015 sample of naval personnel. Dividing this number by the average yearly rate of treatment possible by a dental officer (2,495.92) yields the figure 0.00406, representing the dental officer man-years necessary to treat 10.13 simple and compound cavities per person. By using 0.00406 dental officer man-years per person as a constant, the number of dental officers required for any given number of naval personnel can be determined. This product is the number of dental officer man-years necessary to treat the average number of simple and compound cavities found in such a given group, along with other treatment procedures at the rate shown in Table 1.

The results of more detailed analysis of significant geographic and age variations for each dental item considered will be the subject of subsequent reports.

It might be interesting to note that the number of restorations which were actually placed in 1942-1944 in 2,155,133 naval personnel was 22,023,268. The number of cavities estimated to be present in this number would be 21,831,497, using the methods described in this paper. The average number of dental officers who were on actual duty in this period was 3,467.72. This number of dental officers required three years to place the restorations recorded, in addition to other treatments, or 10,403.16 dental officer man-years. The estimated number of dental officer man-years required to treat the estimated cavities in 2,155,133 persons would be 8,749.84 or 2,916± dental officers working three years. An increase in average dental treatments required in 1943-1944, particularly in prosthetic replacements, was due to the necessity of lowering naval dental standards for entrance into the service, and may account for the greater number of dental officers actually on duty than that estimated to be necessary by 1942 naval dental standards. However, this is in keeping with the methods described in this paper which emphasize that any rate of increase in treatment procedures other than fillings would necessitate either an increase in dental officer personnel or a decrease in the number of other treatments which could be rendered.

Attention is again invited to the fact that the rate of increase of caries in adults has not been considered in this study, although sparse data[4, 10, 11] indicate an average increase per year to be between 0.29 and 2.0 new carious areas for each person.

1. Analysis of dental examination records made in 1942 on a sample of 71,015 naval personnel, corrected for the number of cavities missed at routine examination (correction factor 2.75), revealed that it would take approximately 0.00406 of a dental officer man-year to treat the simple and compound cavities found in the average mouth.

2. It is estimated that it would require 12,174± dental officers a year to treat the simple and compound cavities found in a 3,000,000 man Navy (0.00406× 3,000,000), complying with those dental standards for entrance which were in effect in 1942. This estimation does not consider the rate of increase of dental treatments necessary with age.—*National Naval Medical Center.*

10. Schlack, C. A.: Rate of Increase of Dental Caries in 707 Officers and Men Aboard an American Man-of-War. J. D. Res. 20:477, October 1941.

11. Arnold, F. A.; Dean, H. T., and Singleton, D. E., Jr.: Effect on Caries Incidence of a Single Topical Application of a Fluoride Solution to the Teeth of Young Adult Males of a Military Population. J. D. Res. 23:155, June 1944.

TESTIMONY OF AMERICAN DENTAL ASSOCIATION AT HOUSE HEARINGS ON MATERNAL AND CHILD HEALTH BILL

The proposed Maternal and Child Welfare Act of 1945 "does not comprise a comprehensive program for dental health for the American people," C. Willard Camalier, chairman of the War Service and Postwar Planning Committee, American Dental Association, asserted June 22 at a hearing before the Senate Committee on Education and Labor.

Following is the text of Dr. Camalier's statement:

Senator Pepper: Dr. C. Willard Camalier, American Dental Association.

Dr. Camalier: Senator Pepper, members of the Committee. I am a local practicing dentist, and Past President of the American Dental Association, and submit this statement on behalf of the legislative committee of that organization.

Senator Pepper: What is your address?

Dr. Camalier: 1726 Eye St., N.W.—I think I can save the Committee a little time by filing this statement for the record and then discuss the outstanding points.

Senator Pepper: Thank you.

(The statement is as follows:)

Dr. Camalier: As you know, the American Dental Association represents about 75 per cent of the dentists of the country, and is composed of about 56,000 total out of 75,000 in the United States.

We are organized very well, as you gentlemen understand. The House of Delegates meets annually and passes on these matters of policy as it has in this type of legislation, and this statement today reflects just about the view of the organization.

We do feel that the objectives of the bill are good, but we differ a good deal with the technical phases of it. We feel that if some changes could be made it is possible that it might be acceptable to the Association. However, we feel that it does not comprise a comprehensive program for dental health for the American people.

For instance, the Association has adopted four principles that I think have been filed with this Committee and I will not burden you with them except to state that they embody research, dental health education and dental care. And they request that in all conferences having to do with dentistry, representatives of the American Dental Association be considered. That has not always been true.

Some advisory committees have been selected for consultation but not with the approval of the Association, the result being that we feel that the profession in the United States has not been properly represented at these conferences.

The American Dental Association does not believe that the dental provisions of S.1318 will assure the establishment of sound and effective community dental health—it does not contain specific provisions for dental research, dental health education and dental care in accordance with the four principles contained above. Therefore the bill will not permit the establishment and maintenance of a comprehensive dental program.

Second, S.1318 does not specifically provide dental funds for a dental program nor does it proportion the funds to be used for dental health. Experience has shown in the past that public health agencies are reluctant to budget a fair proportion of available funds for dental health programs.

The amount of money budgeted for dental health plans at the state level in the United States for the fiscal year 1941 was only sixtenths of 1 per cent of the $109,000,000 budgeted from all sources for cooperative health work.

The extent of the dental disease problem is far out of proportion to the small percentage of funds now allocated for dental purposes. Dentists and dental health officers who have worked in the public health field for many years are convinced that this problem will never be solved until funds are specifically allotted for dental health programs. S.1318 does not give that assurance.

S.1318 does not provide specifically for a

national dental advisory committee to assist the Children's Bureau in the adoption of administrative policies and regulations; nor does the bill provide specifically for state dental advisory committees which would be consulted relative to the adoption of state plans.

Now, on that point, gentlemen, we feel, as I said here before, that representatives of the American Dental Association should be invited to be on these advisory committees, and we also feel that the nominations might be made from the American Dental Association to these committees.

Now, it seems to me that that is a democratic way of handling the thing. At the present time you have your chiefs of your governmental services making selections, and sometimes they are not in the best interests of the problems to be considered, but we feel that the most democratic way would be to have these men selected by large groups who are primarily interested in the problem.

I can cite, for instance, the procurement and assignment service of the War Manpower Commission during the war, of which I happened to be a member. We were selected by various organizations, medical, dental and veterinary organizations, and we served the Army and Navy and Public Health Service, I think, in quite a creditable way.

We represented a large group of professional people and we were not bound specifically as they are apt to say of these representatives, by the actions of our organization, but we often took our findings back to the organization, got their reactions and brought them to the conferences; and we feel this procedure was of real value to the governmental agencies. That would hold true at the state level.

Section 103, paragraph 10 of the bill (page 7, lines 6-13), states that a state plan for maternal and child health services must "provide for a general advisory council . . . composed of members of the professions . . . and for technical advisory committees . . . composed of medical and other professional groups concerned with the administration or operation of the state plan."

Section 105, paragraph 1 (page 10, lines 9-14), states that "the Chief of the Children's Bureau shall formulate general policies for the administration of this title after consultation with (1) a conference of state health officers and (2) an advisory committee composed of professional and public members, and as necessary, technical advisory committees, which he shall appoint."

While it might be assumed that dental advisory committees could be classified as "technical advisory committees," the wording of the bill is unnecessarily vague. The appointment of dental advisory committees would be left to the discretion of the state health agency and the Chief of the Children's Bureau. Such indefinite policies are not satisfactory to the dental profession.

S.1318 is vague with respect to the provision of dental services. It proposes to make dental care available to all mothers and children. However, all references to dentistry are omitted on those sections dealing with the provisions of health services. For example, page 6, lines 9-13, provides that state plans must make provisions for "payments to individual physicians for care furnished under this title on a per capita, salary, per case, or per session basis, or in the case of consultations or emergency visits on a fee-for-service basis."

S.1318 contains no information as to how dentists will be paid for dental services.

No mention is made of dental provisions in any of the other sections dealing with public health and medical care, although the first paragraph states that it is the purpose of the bill to provide medical, nursing, dental, hospital and related services.

Now, as stated, the American Dental Association is opposed to the enactment of S.1318 in its present form. Extensive revisions would need to be made to meet the Association's requirements for a satisfactory dental health program for mothers and children. The American Dental Association believes a better plan would be to secure the passage of S.190 and S.1099. The former has already passed the Senate. These bills provide federal grants-in-aid to the states for intensified dental research and for experimental programs in all phases of dental health education and dental care.

Contrasts of the proposal are contained in all other health bills now before Congress. S.190 and S.1099 would provide the means for a realistic and comprehensive attack on the dental disease problem.

The enactment of S.190 and S.1099 would

provide the means for a systematic development of dental health programs designed:

1. To prevent dental diseases by discovering more effective preventive methods.

2. To control dental diseases by the expansion of community dental programs. These programs should be maintenance programs centered on the control of the annual increment of new dental defects in children.

3. To educate the public relative to the importance of dental health and the methods by which dental health can be achieved.

We hope that the United States Senate will give favorable consideration to S.1099 as it has done in the case of S.190 sponsored by the American Dental Association.

Mr. Chairman, that concludes my statement.

Senator Donnell: Doctor, going back to the fundamental theory of this bill, as I understand it, namely, the use of public funds, to make them available to all persons within these classes, namely, the maternal class, and all children of the country, do you favor the theory under which public funds shall be used to pay all the expenses of medical, dental care, etc., as listed in this bill, for all children in the country, and for all mothers during the period of pregnancy, or what is termed here the maternity period, or do you think that that is not advisable?

The theory I am trying to put before you is the theory of public funds for the payment of all of these expenses for all of the children in the United States for whom application may be made, and for all mothers during the maternity period.

Do you favor that theory?

Dr. Camalier: I think, Senator, that a common sense viewpoint of that would be that those who could not afford to pay for this should have the benefits.

Senator Donnell: I am not sure if I understand your ultimate conclusion. You say that those who could not afford to pay should be the ones to receive the benefits.

Dr. Camalier: Yes, sir. I would feel that way.

Senator Donnell: Then as to the people who can afford to pay, do you think they should receive the public moneys or the services purchased with public moneys?

Dr. Camalier: I would say that if there were certain individuals in the country, a family, for instance, that would not be willing to give these services to their child, I think that somebody should step in, either the community, or in the long run the federal or state government, because the child should get the service irrespective of whether somebody wants to give it to him or not. But I think it goes in that order: The individual, the community, the state, or the federal government should take care of the situation.

Senator Donnell: That does not quite answer the point I had in mind, Doctor, at least I did not get it.

The point I have in mind is this: Do you think it is advisable to take out of the public Treasury and pay for all the health, nursing, dental, hospital services, of all the children in the United States, without reference to whether those children and their parents are able to pay for those services or not?

Dr. Camalier: No, I do not.

Senator Donnell: This bill, at least, makes those funds available for that purpose to every child in the United States, does it not?

Dr. Camalier: Yes, it does.

Senator Donnell: So that to that extent you would not favor this bill?

Dr. Camalier: If the funds are made available I think there should be some control somewhere, to differentiate between those that cannot and can afford to pay. It could best be controlled at the state level.

Senator Donnell: And there is no such differentiation in this bill?

Dr. Camalier: No, I have not seen it.

Senator Donnell: Of course, the point is made, and I can well see its effectiveness, by Senator Pepper, that it may be very difficult to impose a test to determine whether or not a person has the need or does not have the need. Nevertheless, as I understand your view, you do not favor the principle of using public money to pay all this type of expense for people that can afford to pay for it.

Dr. Camalier: Yes, sir.

Senator Donnell: Doctor, there is one matter here, that is a matter of draftsmanship and I am just asking your opinion on it. Do you think that the bill clearly covers all dental services of children?

Dr. Camalier: No, I do not. That is what we are complaining about. It is not included in there. Dentistry is not in there where it should be. We are filing an analytical state-

ment to that effect, which will be helpful to you.

(The statement is as follows:)

Senator Donnell: In other words, you do not think that the bill clearly shows that all children are entitled to dental services?

Dr. Camalier: That is right.

Senator Donnell: It uses the term "dental" at various points. For instance, line 2 on page 21 uses the word "dental," and again over on page 5, line 8, it uses the word "dental." But I share with you, Doctor, the query, at any rate, as to whether or not this bill is free from ambiguity on that, because I observed that the location of the word "dental" on page 21 is in this connection: "Including medical, nursing, dental, hospital, and related services and facilities required for maternity care, preventive health work and diagnostic services for children," etc.

It is the practice, in so far as possible, to see that proper dental care is given to women who are about to become mothers?

Dr. Camalier: Well, yes, they try to do that.

Senator Donnell: So that this bill, at least, is susceptible of construction that the dental care referred to in line 2, page 21, is that which is limited to the dental services required for that maternity care.

Dr. Camalier: That is right, and it is extremely important, if you had that, to take into consideration that when the funds are not earmarked for dentistry we do not get our proportionate share at the state level.

Senator Donnell: You think the bill is ambiguous as to whether or not it covers dental care for children?

Dr. Camalier: Yes.

Senator Donnell: On page 5, line 8, where I mentioned the word "dental," that is simply in the connection that the methods of administration to be specified in the state plans shall be such as are necessary for the proper and efficient operation of the plan, including methods relating to the establishment and maintenance of standards for professional personnel, rendering medical, "dental, et cetera" types of care.

Dr. Camalier: Yes, sir.

Senator Donnell: So that that again does not specify with any clarity whether or not the children are to be beneficiaries of the dental care.

Dr. Camalier: That is right.

Senator Donnell: And that is one of the points, Doctor, that you are making?

Dr. Camalier: Yes, sir.

Senator Donnell: I have not seen your statement but I assume you have given it in some detail in your printed statement.

Dr. Camalier: Yes, we have.

Senator Donnell: Dr. Camalier, we are very much obliged to you for pointing out deficiencies in the bill in respect to the provision of dental care. Of course, I can assure you that I for one am just as much interested in fully adequate dental care being provided to the children of the country as any other of the services. We will give very particular attention to your suggestion as to how we can make it clearer in the bill that adequate dental services shall be provided for the children.

It is your opinion, is it not, that the children of the country at the present time for one reason or another are not getting all the dental care that they should have?

Dr. Camalier: That is true, yes.

Senator Pepper: And you welcome a plan that will make it possible for the children to get dental care that they should have?

Dr. Camalier: Yes, and may I add that the American Dental Association has foreseen that contingency and we have presented these two bills to Congress.

Senator Pepper: Your research bill we have already approved in the Senate, as also in this Committee.

I am one of the introducers of your S.1099, the welfare bill, and I am very strongly for it.

We did not put in a means test in S.1099, did we?

Dr. Camalier: No, sir.

Senator Pepper: We all recognize that the reason we have not put the means test in, and the reason that some of us do not favor a means test, is the difficulty of defining the means test so that it will not mitigate against people who ought to have the services that are provided in legislation. That is correct, is it not?

Dr. Camalier: That is correct.

Senator Pepper: It is such a difficult thing to determine, as Dr. Oppenheimer pointed out a bit ago, when people are able to provide the medical services that they really need, is it not?

Dr. Camalier: Yes, sir.

Senator Pepper: We have the financially

indigent and then we have the medically indigent. Somebody might be making a fair income and yet if, as Dr. Oppenheimer pointed out, they have to provide constant care for crippled children over a period of years, they really would not be able to do it without burdening their whole family in order to do so.

Now, Doctor, do you recall having seen the figures that two-thirds of the children of the country are parts of families which have weekly incomes of less than $40?

Dr. Camalier: No, sir, I had not seen those figures.

Senator Pepper: I have seen those figures and I have some reason to believe in their accuracy.

Have you also heard that the majority of the children are in rather large families, and it is by some coincidence that the poorer people have the larger families in the country?

Dr. Camalier: Yes, I have noticed that.

I might say, though, in that connection, that I am sure it would be of interest to your Committee to know that here, in the District of Columbia, the dental society sponsored the dental clinics they have here—and I think there are fourteen or fifteen of them—and we found out that in the service rendered, the poor families were not always getting the services in the clinics. So, naturally, there would have to be some differentiation made.

So the health officer, with the aid of the dental society, worked up a very simple plan which I think is working very well in that it merely asks the parent, when they receive the dental slip, whether they can afford to have their work done by a private dentist or must they go to the clinic. Then the parents state whether they cannot afford it or can afford it. That is approved by the teacher and the principal, as I understand. Dr. Oppenheimer will bear me out on that.

The result has been that the school children here, the poorer ones, are getting the service, whereas before that plan was put into effect others got the service that really were not entitled to it.

So I think you will find from Dr. Ruhland and Dr. Murphy that the system in the District is working very well.

Senator Pepper: Do I understand, Dr. Camalier, that it is your advice to us that you do favor this bill in principle, provided we make it clear that the needed dental services are made available?

Dr. Camalier: Yes, sir, and our objections met. We insist, however, that the passage of S.190 and S.1099 would better meet the situation.

Senator Donnell: I understood there would be a very important modification on that, that you do not favor in principle the grants of public moneys to people who do not need those moneys.

Dr. Camalier: Yes. That is just common sense.

Senator Pepper: Are you able to give us any means test of need?

Dr. Camalier: That is the only one, so far, that I just gave you, in the District of Columbia. I think this problem can be worked out at the state level.

Senator Pepper: That is the statement of the people themselves as to whether they felt they were able to pay?

Dr. Camalier: Yes. But I think studies along that line might develop it. I do not think anybody has given it real study. I can appreciate the difficulties, however, Senator.

Senator Pepper: You do appreciate the difficulties of trying to lay down a means test.

Dr. Camalier: Yes, sir.

Senator Pepper: Thank you, very much.

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CONGRESS GOES HOME

Congress has gone home. One-third of the members of the Senate and all of the members of the House of Representatives will face their constituencies in elections before Congress convenes again. Unless a special session is called during the last months of the year, there will be no further legislative activity until the new Congress meets in January 1947. All bills introduced in the current 79th Congress die automatically and must be reintroduced in the next session to receive further consideration.

The last days of the session were hectic as usual, and many bills failed in being called up for consideration because of conditions created by the crisis on OPA and other measures.

Wagner-Murray-Dingell Bill.—The Wagner-Murray-Dingell bill (S. 1606) did not make much progress toward enactment in its present form even though extended hearings were held from April 2 to July 10 before the Senate Committee on Education and Labor. A subcommittee of this group did issue an interim report[1] on health insurance but did not give approval to the Wagner-Murray-Dingell measure. The report, which limited itself to an advocacy of a system of national health insurance, was signed by Senators Claude Pepper, Florida; Elbert D. Thomas, Utah; James E. Murray, Montana; and George D. Aiken, Vermont. Senators Robert A. Taft, Ohio, and H. Alexander Smith, New Jersey, dissented from some of the findings and conclusions; Senators Lister Hill, Alabama, James M. Tunnell, Delaware, and Wayne L. Morse, Oregon, indicated that they had not completed their study of the report.

The proponents of the Wagner-Murray-Dingell bill were successful during this term of Congress in focusing public attention on national health needs and programs. They were not successful, however, in getting the measure closer to enactment because the methods proposed met with such forthright opposition on the

1. Interim Report from the Subcommittee on Health and Education to the Committee on Education and Labor. Washington: U. S. Government Printing Office, 1946.

part of so many groups and individuals. Legislation of this type is not dead, and the new Congress may well witness a flood of new health measures early next year. The Senate hearings revealed a rather sharp difference in philosophy on health legislation among members of the committee. One group advocated a national system of health insurance while the other countered with a program of grants-in-aid to the states. Unless this basic difference is compromised, it will be difficult for any comprehensive health legislation to get early and favorable consideration from the Senate.

Taft-Ball-Smith Bill.—This measure (S. 2143),[2] which also lapses with the close of the session, did not proceed to hearings before a Senate committee. It is interesting because it embodies the grants-in-aid principle as contrasted with a federal system of health insurance. It is quite likely that a revised bill on the same general pattern will be introduced early in the next session.

Maternal and Child Health Bill.—The Maternal and Child Health bill, also known as the Pepper bill (H. R. 3922),[3] received strong support in the closing days of the session. Opposition prevented the bill from being reported favorably, but there was general agreement that funds for maternal and child health should be enlarged. Congress subsequently provided additional funds for an expanded program of maternal and child health services, for crippled children's services and for child welfare services. This bill, in amended form, is a candidate for reintroduction in the new session.

A.D.A. Bills.—The two bills sponsored by the American Dental Association were not enacted and will be reintroduced in the next session. The Dental Research Bill (S. 190) was favorably reported by the Senate Committee on Education and Labor and passed. It was not acted upon by the House committee, owing to the "press of other legislation." S. 1099, the dental health education and dental care bill, met some difference of opinion in the Senate subcommittee and was not reported to the Senate before the end of the session.

Army Dental Corps Bill.—The Army Dental Corps bill (H. R. 6750),[4] introduced at the request of the American Dental Association to "provide more efficient dental care for the personnel of the United States Army," was not enacted. It was introduced late in the session, and time did not permit hearings by a House committee. It will be reintroduced early in the next session.

Other Legislation.—President Truman's reorganization plan for the health and security agencies of the federal government was opposed by the House of Representatives but won approval in the Senate. The reorganization plan, therefore, became effective July 14. It is expected in many quarters that efforts will be made in the next session to give this agency cabinet status. The full import of the reorganization plan, however, will not become entirely clear until staff organization, changes and personnel are announced.

The number of health measures introduced in Congress during this session, the support given by the special message of the President on health problems and the wide popular discussion of the subject mean that the issue of health legislation will continue to be a prominent one. The present need is not for a smug satisfac-

2. See page 1187 for a discussion of this bill.

3. Testimony of the American Dental Association on Maternal and Child Health Bill (H. R. 3922). J.A.D.A. 33:1012, August 1, 1946.

4. House Gets A.D.A. Bill Calling for Greater Autonomy for Army Dental Service. J.A.D.A. 33:949, July 15, 1946.

tion that legislative efforts have been halted. The need is for a better understanding of the basic problems by both the public and the profession so that a more informed attention can be given to providing better health care for all of the people.

THE ANNUAL MEETING AT MIAMI

The first postwar session of the House of Delegates of the American Dental Association will be held in Miami, October 14-16. Because of wartime stringencies in hotel accommodations and railroad reservations, no annual meeting of the House of Delegates was held last year. Officers were held over for another year and essential business was transacted by the House of Delegates. All of the many practical limitations on large conventions have not yet disappeared, so no scientific program has been scheduled for Miami. The House of Delegates, however, will complete plans for a full-scale meeting in 1947. If crowded convention cities continue to be the rule rather than the exception, the House of Delegates might well consider selecting its meeting place two or three years in advance, a practice that has worked successfully for other organizations.

The eighty-seventh annual session of the House of Delegates will be confronted by many problems and the need to legislate on matters that were necessarily deferred during the war. It is important, therefore, that each constituent society have a full delegation at Miami so that all of these issues can be resolved democratically.

ABSENTEEISM AND DENTAL DISEASES

Absenteeism, which became an acute problem during the war when man-hours were needed for production, has many causes. In its chronic state, absenteeism is related in large degree to ill health. This has led to the widespread development of industrial medical programs and, in a much smaller degree, to industrial dental programs. In the past few years, under initiative provided by the Committee on Economics and the Industrial Dental Committee of the Council on Dental Health of the American Dental Association and the American Association of Industrial Dentists, the subject has been explored and some advances have been made. These advances could be made more rapidly if there were more comprehensive studies on the relation between dental diseases and industrial absenteeism. In this issue,[1] Puffer and Sebelius report on absenteeism in Tennessee industrial plants caused by diseases of the teeth and gums. Their findings are of interest and point to the need for considering dental problems in industry more seriously.

Puffer and Sebelius found that in one year, in a group of 5,988 employees in industry, there were 283 absences as a result of diseases of the teeth and gums. The average length of these absences was 4.4 days, making a total loss of more than 1,200 employee-days for the entire group. Twelve per cent of the 283 absences were eight days or longer in duration, with an average severity rate of 18.9 days. Absenteeism of this order has a high cost both to the individual and to industry when compared to the cost of effective dental prevention and treatment. The

1. See page 1122.

authors quote Heacock[2] as noting that "the rate for dental disability was almost on a parity with that for tuberculosis, and this being the case, it seemed odd that we should spend thousands of dollars for the prevention of tuberculosis and pennies for dental prophylaxis."

As a result of their study, the authors recommend (1) that more fact-finding surveys be made to demonstrate graphically the need for dental service in many plants; (2) that a better understanding of the role and purpose of industrial dental service is needed; (3) that the findings and treatment of the dental service in industry should be closely integrated with the other services affecting the general health of the individual.

2. Heacock, L. D.: The Place of Dentistry in Industrial Health Program. Indust. Med. 12:672, October 1943.

DELEGATES AND ALTERNATES LISTED FOR EIGHTY-SEVENTH ANNUAL MEETING OF HOUSE OF DELEGATES, MIAMI, OCTOBER 14-16, 1946

The following delegates and alternates to the eighty-seventh annual meeting of the House of Delegates of the American Dental Association, Miami, October 14-16, 1946, have been listed by Harry B. Pinney, General Secretary.

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Delegates:

Allen, Hunter S., Comer Bldg., Birmingham.
Blue, J. A., Merchants National Bank Bldg., Mobile.
Kirkland, Olin, Shepherd Bldg., Montgomery.

Alternates:

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Gillespy, J. S., Frank Nelson Bldg., Birmingham.
Wood, W. A., Merchants National Bank Bldg., Mobile.

Arizona

Delegate:

Bennett, Paul H., Valley National Bank Bldg., Tucson.

Arkansas

Delegates:

Cone, George, Osceola.
Sternberg, I. M., Merchants National Bank Bldg., Fort Smith.

Alternates:

Gibbs, M. D., Medical Arts Bldg., Hot Springs.
Child, Fred R., Blytheville.

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Kingsbury, B. C., 490 Post St., San Francisco.
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Hemingway, J. B., Waverly.

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Renouard, C. S., Butte.

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Steinmiller, G. C., Masonic Temple Bldg., Reno.

Alternate:

Cafferata, H. E., First National Bank Bldg., Reno.

New Hampshire

Delegates:

Frost, Robinson C., 814 Elm St., Manchester.
Keane, Edward F., Newport.

Alternates:

Sargent, Robert E., Bristol.
Roulier, Paul R., 648 Main St., Laconia.

New Jersey

Delegates:

White, Edward R., 921 Bergen Ave., Jersey City.
Jennings, Edward J., 126 West State St., Trenton.
Crowe, Charles P., 521 Main St., East Orange.
Owens, John S., 414 Cooper St., Camden.
Houghton, Frank J., Medical Center, Jersey City.
Hopper, Craft A., 534 Broadway, Paterson.
Reock, Ernest C., 367 Washington Ave., Belleville.
Weber, Paul M., Citizens National Bank Bldg., Englewood.
Hanley, James L., 586 Central Ave., East Orange.
Reese, Sylvanus F., 4401 Atlantic Ave., Ventnor.
Newman, Eugene W., 16 Wallace St., Red Bank.

Alternates:

Samuel, James H., Record Bldg., Morristown.
Devlin, Gerard A., 49 Bleeker St., Newark.
Westcott, Eugene R., 1500 Pacific Ave., Atlantic City.
Giblin, William A., 85 Park St., Montclair.
Carr, John G., 414 Cooper St., Camden.
Rosenwasser, Benjamin, 4809 Bergenline Ave., Union City.
Giordano, James V., 425 Union Ave., Paterson.
Schweikhardt, C. J., 68 Belmont Ave., Newark.
Greenwald, Louis E., 20 West Palisade Ave., Englewood.
Schneider, Ernest J. H., 519 Prospect St., Maplewood.

Whitehill, Norman J., 1904 Pacific Ave., Atlantic City.
Burke, J. Frank, 921 Bergen Ave., Jersey City.

New Mexico

Delegates:

Berardinelli, J., Sante Fe.
Clarke, J. J., Box 1075, Artesia.

New York

Delegates:

Abbey, Leon L., 619 Union St., Schenectady.
Adams, Fred R., 55 West Forty-Second St., New York.
Back, Philip, 237 Willis Ave., New York.
Bell, Willard S., 118-02 Rockaway Blvd., Ozone Park.
Bissell, Tracy M., 3337 Bailey Ave., Buffalo.
Blum, Theodor, 101 West Seventy-Ninth St., New York.
Burgun, Joseph A., 142 Joralemon St., Brooklyn.
Burkhart, Harvey J., 800 East Main St., Rochester.
Burns, G. G., 133 Clinton Ave. South, Rochester.
Burr, LeRoy E., 27 Ludlow St., Yonkers.
Carter, John H., 143 Mohawk St., Cohoes.
Cheney, Howard A., 377 South Broadway, Yonkers.
Clug, Bernard, 17 Park Ave., New York.
Cullen, Thomas R., 189 West First St., Oswego.
Gale, E. Harold, 142 Washington Ave., Albany.
Glaser, Joseph M., 137-01 Jamaica Ave., Jamaica.
Greenwood, George D., Sibley Tower Bldg., Rochester.
Heinze, Robert L., 1 Hanson Place, Brooklyn.
Howland, Wells, 122 Front St., Binghamton.
Isaacson, Samuel A., 501 Madison Ave., New York.
Jutton, Daniel, State Tower Bldg., Syracuse.
Merritt, Arthur H., 580 Fifth Ave., New York.
Mork, Waldo H., 501 Madison Ave., New York.
Moss, Harry M., 57 West Fifty-Seventh St., New York.
Nelson, Conrad H., Physicians Bldg., Jamestown.
Neuber, Augustave, 619 Union St., Schenectady.
Nobert, O. E., 131 West Dominick St., Rome.
Pankow, Charles A., 902 Main St., Buffalo.
Phillips, Percy T., 18 East Forty-Eighth St., New York.
Roberts, Myron A., 471 Linwood Ave., Buffalo.
Schlafer, G. P., Delhi.
Schoenfeld, Morris, 140 West Seventy-Ninth St., New York.
Schuyler, Clyde H., 400 Madison Ave., New York.
Shapiro, Simon, 142 Joralemon St., Brooklyn.
Squires, Franklin A., 170 Maple Ave., White Plains.
Tench, Russell W., 745 Fifth Ave., New York.
Webb, William R., 3441 Seventy-Ninth St., Jackson Heights.
Wells, C. Raymond, 1 DeKalb Ave., Brooklyn.
Wilkie, Charles A., 1 Hanson Place, Brooklyn.
Zillmann, Paul W., 29 Walden Ave., Buffalo.

Alternates:

Bickelhaup, A. C., State Tower Bldg., Syracuse.
Blumenthal, Emanuel E., 1 Hanson Place, Brooklyn.
Brophy, Frederick H., 200 West Fifty-Ninth St., New York.
Burns, William McGill, 80 Hanson Place, Brooklyn.
Bush, E. Ogden, Walton.
Chase, Oscar J., 140 East Fifty-Fourth St., New York.
Doran, Edward J., Brisbane Bldg., Buffalo.
Eisner, Samual, 853 Broadway, New York.
Fennelly, William A., 33 West Forty-Second St., New York.
Flynn, John T., Harwood Court, Scarsdale.
Gordon, William F., 3005 Grand Concourse, New York.
Johnson, Gustaf, 1 Hanson Place, Brooklyn.
Jones, Paul, 89 East Ave., Rochester.
Lanza, Alfred A., 599 Fifth Ave., New York.
McLaren, Frank J., 1 Nevins St., Brooklyn.
Merrihew, Noel H., Westport.
Morse, Roland E., 14 West Forty-Ninth St., New York.
Muir, William M., Gowanda.
Padelford, Donald C., Medical Arts Bldg., Rochester.
Parlato, A. V., Dunkirk.
Reisman, Harry, 40 Monroe St., New York.
Shapiro, Jacob, 766 Eastern Parkway, Brooklyn.
Stevens, Walter W., 54 Noxon St., Poughkeepsie.
Tracy, Martin C., 9 Rockefeller Plaza, New York.
VanValey, Edwin G., 38 East Sixty-First St., New York.
Walsh, Frank K., 358 Broadway, Troy.

North Carolina

Delegates:

Fitzgerald, Paul, Greenville.
Jackson, Wilbert, Clinton.
Jones, Paul E., Farmville.
Lineberger, H. O., Raleigh.

Alternates:

Alford, Frank O., Liberty Life Bldg., Charlotte.
Poindexter, C. C., Box 1265, Greensboro.
Olive, R. M., Box 662, Fayetteville.

North Dakota

Delegates:

Toepke, W. D., New Salem.
Nedrud, H. J., Minot.

Alternates:

Blunt, J. K., Bismarck.
Foley, H. E., Grand Forks.

Ohio

Delegates:

Ball, Edward L., Doctors Bldg., Cincinnati.
Pryor, Walter J., Rose Bldg., Cleveland.
Wolford, William H., Farmers Bank Bldg., Mansfield.
Jones, Earl G., 185 East State St., Columbus.
Black, Frederick W., Doctors Bldg., Cincinnati.
Postle, W. D., 1714 North High St., Columbus.
Bach, E. N., Professional Bldg., Toledo.
Jarvis, Holly C., Mercantile Library Bldg., Cincinnati.
Longfellow, J. C., Bellefontaine.
Hurst, W. W., 2165 Adelbert Road, Cleveland.
McDermott, T. J., Rose Bldg., Cleveland.
Hebble, Clyde H., 327 East State St., Columbus.
Mills, E. C., 220 South Cassady Ave., Columbus.
Schott, C. H., Neave Bldg., Cincinnati.

Alternates:

Wylie, W. L., 2165 Adelbert Road, Cleveland.
Aufderheide, P. J., Rose Bldg., Cleveland.
Pettibone, E. L., 14805 Detroit Ave., Lakewood.
Gregg, C. C., Rittman.
Sargeant, W. S., Nicholas Bldg., Toledo.
Dalton, V. B., 116 Garfield Place, Cincinnati.
Stricker, C. H., Doctors Bldg., Cincinnati.
Gentilly, J. V., Rose Bldg., Cleveland.
Reiman, H. A., Wooster.
Creig, R. E., 10465 Carnegie Ave., Cleveland.
Sterling, W. J., 6412 Lorain Ave., Cleveland.
Hoppe, H. J., 4186 Pearl Road, Cleveland.
Ridings, S. F., 513 Walnut St., Greenville.
Heibert, A. C., Second National Bank Bldg., Akron.

Oklahoma

Delegates:

Pitney, Fred O., Medical Arts Bldg., Oklahoma City.
Wise, Eugene W., Medical Arts Bldg., Tulsa.
Bonnell, A. E., Surety Bldg., Muskogee.
Warrick, H. O., Enid.

Alternates:

Bertram, Frank P., 3400 North Eastern St., Oklahoma City.
Hess, Charles A., Durant.
Dunn, R. M., Medical Arts Bldg., Tulsa.
Ratliff, J. B., Hobart.

Oregon

Delegates:

Walrath, C. Herbert, Selling Bldg., Portland.
Bettman, M. M., Medical Arts Bldg., Portland.
Fixott, H. C., Medical Dental Bldg., Portland.
Bartels, John C., Selling Bldg., Portland.

Panama

Pennsylvania

Delegates:

Eaton, Milon P., 4005 Chestnut St., Philadelphia.
Smith, E. Howell, 4001 Spruce St., Philadelphia.
Walls, Ray M., 48 East Market St., Bethlehem.
Levy, Saul, Medical Arts Bldg., Scranton.
Willits, H. K., 750 North Tenth St., Reading.
Romberger, Paul, 116 East Chestnut St., Lancaster.
Whittaker, John E., 301 Washington Blvd., Williamsport.
Miller, Fred D., 1122 Twelfth Ave., Altoona.
Wenk, Karl E., Kane.
Balthaser, J. B., 549 West Eighth St., Erie.
Craig, W. Earle, Jenkins Arcade, Pittsburgh.
Adams, Robert, 710 West York St., Philadelphia.
Young, A. C., 121 University Place, Pittsburgh.
Timmons, G. D., 1808 Spring Garden St., Philadelphia.
Harkins, C. S., Box 176, Osceola Mills.
Reichard, H. C., Riant Theatre Bldg., Conshohocken.
Booth, A. A., Boyle Bldg., Sharon.
Price, J. B., 6013 Greene St., Philadelphia.
Cohen, Abram, 269 South Nineteenth St., Philadelphia.
Crosby, J. Maurice, I.O.O.F. Bldg., Bradford.
Mesjian, H. C., 3922 Chestnut St., Philadelphia.
Robinson, W. J., 4906 Walnut St., Philadelphia.
Butts, Homer C., Union Trust Bldg., Pittsburgh.
Marbarger, C. P., 103 West Main St., Palmyra.

Alternates:

Hess, Lawrence E., 1234 West Allegheny Ave., Philadelphia.
Steeley, W. L., 338 Juniper St., Quakertown.
Miller, Allison H., 299 Wyoming Ave., Kingston.
Brennan, N. C., 13 South Main St., Shenandoah.
Reidel, O. E., 25 East King St., York.
Shipe, Broscious, Selinsgrove.
Crouse, H. M., Johnstown Trust Bldg., Johnstown.
Kilbury, K. E., Bradford.
Wade, W. F., 258 West Tenth St., Erie.
Irish, R. E., Fulton Bldg., Pittsburgh.
Lawson, A. S., Jr., 524 Federal St., N. S. Pittsburgh.
Lyons, E. W., Wellsboro.
Keim, L. L., 606 North Third St., Harrisburg.
Brickley, A. J., California.

Ross, J. W., 1520 Spruce St., Philadelphia.
Forbes, J. W., Medical Arts Bldg., Philadelphia.
Hoeffer, F. H., Medical Arts Bldg., Reading.
Wittek, J. E., 7 West Winona Ave., Norwood.
Ventura, A. L., 333 DeKalb St., Norristown.
Lotz, W. E., 1123 Pennsylvania Ave., Tyrone.
Bruner, M. D., 47 Long Lane, Upper Darby.
Borish, A. L., 255 South Seventeenth St., Philadelphia.
Strayer, E. R., Spruce St. Medical Bldg., Philadelphia.

Philippine Islands

Rhode Island

South Carolina

Delegates:

Dick, George W., Sumter.
Maloney, W. W., Aiken.

Alternates:

Higgins, H. B., Spartanburg.
Bumgardner, E. G., 1517 Hampton Ave., Columbia.

South Dakota

Delegates:

Matteson, F. M., Highmore.
Richards, F. C., Bridgewater.

Alternates:

Elmen, Ernest W., Sioux Falls.
Isaac, Otto, Tyndall.

Tennessee

Delegates:

Towner, J. D., Exchange Bldg., Memphis.
Oliver, Oren A., Medical Arts Bldg., Nashville.
Sharp, J. Guilford, Medical Arts Bldg., Knoxville.
Brooks, W. B., Hamilton National Bank Bldg., Chattanooga.

Alternates:

Graham, George C., Sterick Bldg., Memphis.
Seeman, George F., Doctors Bldg., Nashville.
Alford, W. C., Medical Arts Bldg., Knoxville.
Sullivan, D. A., Cleveland.

Texas

Delegates:

Rogers, R. L., Medical-Professional Bldg., Amarillo.
Elliott, F. C., 1018 Blodgett St., Houston.
Newton, W. T., Esperson Bldg., Houston.
Ogle, Willard, Medical Arts Bldg., Dallas.
Hayes, Stuart E., Medical Arts Bldg., San Antonio.
Thielen, B. F., First National Bank Bldg., Paris.
O'Farrell, J. D., Medical Arts Bldg., Houston.
Talbot, W. O., Trinity Life Bldg., Fort Worth.
Brock, Sam H., Medical Arts Bldg., Dallas.

Alternates:

Waltmon, W. K., Hearne.
Garrison, M. R., Hamilton Bldg., Wichita Falls.
Butler, Charles E., Medical Arts Bldg., San Antonio.
Lynn, C. B., Capital National Bank Bldg., Austin.
Duckworth, T. G., Medical Arts Bldg., San Antonio.
Holder, B. Carl, Nixon Bldg., Corpus Christi.
Parker, M. L., First National Bank Bldg., El Paso.
McCall, W. B., Scott & White Hospital, Temple.
Graber, Fred H., P. O. Box 729, Brenham.

Utah

Delegates:

Dalgleish, R. C., 124 State Capitol, Salt Lake City.
Green, C. G., Boston Bldg., Salt Lake City.

Alternates:

Sears, Victor H., Tribune-Telegram Bldg., Salt Lake City.
Halgren, L. O., First National Bank Bldg., Salt Lake City.

Vermont

Delegates:

Taggart, C. I., Burlington.
Johnson, Earl, Rutland.

Virginia

Delegates:

Hodgkins, W. N., Warrenton.
Bear, Harry, Professional Bldg., Richmond.
Lyons, Harry, Professional Bldg., Richmond.
John, J. E., Medical Arts Bldg., Roanoke.

Alternates:

Van Deusen, O., Front Royal.
Todd, John B., Buxton Clinic, Newport News.
Muir, N. F., Shenandoah Life Bldg., Roanoke.
Garrard, C. K., Allied Arts Bldg., Lynchburg.

Washington

Delegates:

Sutton, B. A., Miller Bldg., Yakima.
Anderson, B. E., Republic Bldg., Seattle.
Dingler, F. J., Medical and Dental Bldg., Seattle.
Shandley, F. S., Medical and Dental Bldg., Seattle.
Barlow, T. M., Bellingham National Bank Bldg., Bellingham.

Alternates:

MacEwan, D. C., Fourth and Pike Bldg., Seattle.
Martin, A. L., Medical and Dental Bldg., Seattle.
Donaldson, A. W., Medical Bldg., Seattle.
Jeffrey, A. W., Medical and Dental Bldg., Seattle.

Wood, F. E., Medical and Dental Bldg., Seattle.

West Virginia

Delegates:

Summers, Howard E., First National Bank Bldg., Huntington.
Cleek, L. D., Medical Arts Bldg., Charleston.
Boydston, W. J., P. O. Box 508, Fairmont.

Alternates:

Sturm, Ward T., 108 Adams St., Fairmont.
Poindexter, J. B., Professional Bldg., Huntington.
Douglass, E. D., Parkersburg.

Wisconsin

Delegates:

Cavanaugh, M. G., 4630 West Burleigh St., Milwaukee.
Martin, F. J., Medford.
Nelson, C. A., Amery.
Morgan, George E., 2039 North Prospect Ave., Milwaukee.
Moen, O. H., Watertown.
Donovan, J. M., Neenah.
LeSage, G. A., 1320 Tower Ave., Superior.
Hardgrove, T. A., Fond du Lac.
Mason, R. A., 953 North Twenty-Seventh St., Milwaukee.
Schaller, W. H., 135 West Wells St., Milwaukee.

Alternates:

Spears, A. J., Baldwin.
Hansen, M. C., Arcade Bldg., Racine.
Cohan, G. N., Board of Trade Bldg., Superior.
Albrecht, A. W., West Bend.
Wendt, W. H., Tenney Bldg., Madison.
Baumgartner, J. F., West Bend.
Stekl, C. F., Baraboo.
Newbury, W. J., Burlington.
Wetzel, E. C., 2522 East Capitol Drive, Milwaukee.
Murphy, F. J., New London.

Wyoming

Delegates:

Hocker, William S., Casper.
King, G. S., Casper.

Army Dental Corps

Delegate:

Tobias, R. B. (Colonel) DC, Dental Surgeon, Headquarters, Fourth Service Command, Post Office Bldg., Atlanta.

Alternate:

Daniels, T. C. (Colonel) DC, Dental Surgeon, Headquarters, Third Service Command, Post Office and Courthouse Bldg., Baltimore.

Navy Dental Corps

Delegate:

Lyle, Alexander G. (Rear Admiral) DC, Bureau of Medicine and Surgery, Navy Department, Washington.

Alternate:

Ulen, Francis G. (Captain) DC, Bureau of Medicine and Surgery, Navy Department, Washington.

U. S. Public Health Service

Delegate:

Wright, William T., U. S. Public Health Service, Washington.

Alternate:

Knutson, John W., U. S. Public Health Service, States Relation Division, Washington.

Veterans Administration

Delegate:

Fowler, M. M., Veterans Administration, Washington.

Alternate:

Toole, Charles L., Jr., Veterans Administration, Branch Office No. 5, Atlanta.

NEWS OF DENTISTRY

Long Agenda Awaits House At October Meeting in Miami

Delegates to the first postwar session of the House of Delegates of the American Dental Association were preparing last month for a heavy schedule of work when the meeting opens October 14 in Miami.

A two-year backlog of work will await the House as a result of wartime suspension of meetings caused by travel conditions. Among items on the long agenda will be plans for a full-scale scientific meeting in 1947.

In addition, the terms of eight trustees, instead of the customary four, will expire in October. The added four, whose terms expired in 1945, were held over for one year because of the abandonment of the meeting. The House also will elect a General Secretary to succeed Harry B. Pinney, who retires at his own request after nineteen years of service in that office.

Presiding over the meeting will be Walter H. Scherer, who has held office as President of the American Dental Association for the last two years. Headquarters of the meeting will be established at the McAllister and Columbus hotels, which are connected by an arcade. Convention delegates also will be housed at the Everglades Hotel, which is a short distance from the headquarters hotels. Reservations can be made as follows:

McAllister Hotel, 10 Biscayne Blvd.: singles, from $4; doubles and twins, from $7; Columbus Hotel, 50 Biscayne Blvd.: singles, from $4; doubles and twins, from $8; Everglades Hotel, 236 Biscayne Blvd.: singles, from $3; doubles and twins, from $5.

A.D.A. Spokesman Urges School Dental Health Programs

Sound dental health education programs can be provided in all schools for a few cents a year per child, Lon W. Morrey, director of the Bureau of Public Relations, American Dental Association, recently told Illinois school administrators and teachers.

Addressing a session of the six-week Health Education Workshop at Illinois State Normal University, Normal, Ill., Dr. Morrey cited school programs at Shorewood, Wis., and Melrose Park, Ill., as examples of dental health programs which could be established in most American communities.

At Shorewood, Dr. Morrey said, only 22 per cent of the 3,000 school children had teeth in good condition when a dental health education program was launched in 1929. Within five years, 87 per cent of the pupils had healthy teeth, and last year the figure reached 92 per cent, he said. Cost of the program, which was conducted by a dental hygienist in cooperation with local dentists, has been $2,500 a year, or 83 cents a child, Dr. Morrey told the educators.

As a result of a similar dental health education program at the St. Paul Evangelical-Lutheran school in Melrose Park, he said, approximately 70 per cent of the 450 pupils enrolled have healthy teeth.

In both communities, no operative work is done at the school, Dr. Morrey explained. The program consists primarily of dental health education, examinations and referrals to family dentists or a dental clinic.

Urge Technician Training To Meet Personnel Needs

In a move to meet an immediate need for trained auxiliary dental personnel, the Prosthetic Dental Service Committee of the American Dental Association passed a resolution at a meeting in New York June 29, urging endorsement of technician training in dental schools.

The resolution specified that the training period be for a minimum of two years and that it lead to a certificate rather than a diploma.

Copies of the resolution were sent to all dental schools in the United States, the Kellogg Foundation, publications of the various laboratory organizations, the American Association of Dental Schools and the American Dental Association.

GOVERNMENT AGENCIES

VA Outlines Policies And Procedures for Dentists

Establishment of the new fee schedule for Veterans Administration dentists, which took effect May 25, was followed by issuance on July 25 of an official outline of changes in policies and procedures.

Text of the outline, contained in Circular No. 182, follows:

1. Change in Policies and Procedures in Rendering Dental Service to Veterans on a Fee Basis.

a. Where VA dental clinic service is not feasibly available, the VA has adopted the policy that all veterans entitled to outpatient dental care at the expense of the VA have free choice of dentists participating in the program of dental care of veterans.

b. The "Schedule of Fees—Dental," Appendix R. & P. 6015, effective May 25, 1946, has been established with the cooperation of the American Dental Association and the VA.

c. Deviations from the fee schedule are permitted at state level by the branch medical director or his designate to meet the fees usually charged the general public for similar services. However, the fee schedule represents state-wide averages, and serious consideration must be given to upward revisions before approving deviation from the basic schedule.

d. Unless negotiated agreements are reached by the branch offices and the individual state dental societies, within the branch areas, the basic fee schedule will be used. (Appendix R. & P. 6015, effective May 25, 1946.)

e. If agreements are negotiated at state level, two copies of the agreement (Fee Schedule) will be forwarded to Central Office, one to the Assistant Administrator for Finance and one to the Chief Medical Director. Copies will be furnished all authorizing and finance officers in branch and regional offices.

f. There will be forwarded to branch offices copies of an issue titled "Instructions to Participating Dentists on a Fee Basis," VAM 10—3, which replaces VA Medical Form 2810. For distribution, see subparagraph (4), paragraph 4.

g. Use of "Designated Dentists" will be continued until their appointments as "Participating Dentists on a Fee Basis" are approved or disapproved in accordance with the procedures outlined in paragraph 2 of this circular. If the appointment of a "Designated Dentist" as a "Participating Dentist" is disapproved, his services will be terminated.

2. Method of Distribution and Instructions Relating to Applications for Appointment of Participating Dentists.

a. Sufficient copies of VA Form 10—2718, "Application for Appointment as Participating Dentist," will be forwarded to all branch offices. This form will be used instead of VA Form 10—2554, "Application of Physician or Dentist for Appointment on Fee Basis."

b. Section I—Application of VA Form 10—2718 will be filled out by dentists in private practice, who desire to render dental service to eligible veterans. Dentists now holding appointments as "Designated Dentists" must also submit VA form 10—2718 for appointments as "Participating Dentists on a Fee Basis." Section II-Nomination, will be used by state dental societies. Section III-Appointment, will be used by branch offices.

c. It is the approved policy of VA to appoint on a fee basis all ethically and professionally qualified dentists who wish to render dental service to veterans. Dentists should be nominated by the state dental society, and their appointments are subject to the approval of the Chief, Dental Division, Branch Office. Dentists so appointed will be known as "Participating Dentists on a Fee Basis," and the term "Designated Dentists" will be discontinued.

d. Methods of distribution and instructions to accompany the application forms are as follows:

(1) The state dental society may mail the

applications to the dentists with letter of transmittal.

(2) The Chief, Dental Division, Branch Office, may mail the applications to the dentists with letter of transmittal.

(3) The letter of transmittal under (1) or (2) must include instructions that the private dentist return his application to the person designated by the state dental society.

(4) The addressograph service of the state dental society, state dental journal or the state board of dental examiners, may be used.

(5) For number of registered dentists by states, see pages 6 and 7, JOURNAL OF THE AMERICAN DENTAL ASSOCIATION, January 1, 1946.

3. Functions of Dental Advisory Committee, State Dental Society.

a. The Dental Advisory Committee, State Dental Society, will:

(1) Approve or disapprove nomination of applicants for appointment as "Participating Dentists on a Fee Basis."

(2) Forward all completed application forms whether approved or disapproved to Deputy Administrator, Branch Office, Attention: Chief, Dental Division, at intervals not exceeding ninety days.

4. Functions of Chief, Dental Division, Branch Office, Relating to Participating Dentists and Dental Societies.

a. The Chief, Dental Division, Branch Office, will:

(1) Arrange a meeting with the appropriate committee of the state dental society to review the approved fee schedule effective May 25, 1946, and to make adjustments at state level, if necessary.

(2) Approve or disapprove all applications for appointment as "Participating Dentists on a Fee Basis."

(3) Forward approved applications to the Director of Personnel, Branch Office, for issue of appropriate notification. A copy of the notification of disapproval of appointment will be sent to the Chairman, State Dental Advisory Committee.

(4) Forward approved applications to the Director of Personnel Service, Branch Office, for issuance of letter of appointment to the "Participating Dentist on a Fee Basis."

(5) Maintain alphabetical monthly lists of participating dentists. These lists will show new appointments, resignations, discontinuances and changes of address. Managers of regional offices and centers will cooperate in reporting to branch offices, by mail, any changes in status of participating dentists coming to their attention. Copies of lists of participating dentists will be furnished to Chief, Dental Section, in each regional office and center, and to each state dental society.

(6) Furnish the participating dentists a copy of "Instructions to Participating Dentists on a Fee Basis," when available.

(7) Must maintain close liaison and good professional relations with dental societies and individual dentists; and all correspondence with either from the branch office, except personnel matters, will be signed by the Chief, Dental Division, or his designate. All matters pertaining to policy will first be cleared with the branch medical director.

5. Suggestions Sent to State Dental Societies by the American Dental Association.

a. The Committee on Economics of the American Dental Association suggested to each state dental society that a dental advisory committee be named to work with the branch office of the VA. The duties of the dental advisory committee were outlined substantially as follows:

(1) Negotiate with the branch office of the VA to establish a dental fee schedule to be used on a state-wide basis and approve the fee schedule for the state dental society.

(2) Receive and submit to the VA all applications for appointment as "Participating Dentists on a Fee Basis."

(3) Pass upon the ethical and professional qualifications of the applicants.

(4) Serve as a liaison group between the state dental society and the VA.

6. Instructions to Chiefs of Dental Sections in Regional Offices and Centers.

a. Refer to paragraph 4 for additional instruction and information relating to chiefs of dental sections. Other instructions are as follows:

(1) Where VA dental clinic service is not feasibly available, the VA has adopted the policy that all veterans entitled to outpatient dental care at the expense of the VA have free choice of dentists participating in the program of dental care of veterans.

(2) Complete (full mouth) roentgenographic examinations will be authorized for initial examination of all eligible beneficiaries.

For subsequent examinations roentgenograms will be taken only for diagnostic needs of specific teeth or areas to be treated.

(3) When the extraction of one or more teeth is indicated and the physical condition of the beneficiary is such that the dentist should be advised, a precautionary notation on the beneficiary's chart will be made.

(4) Fees authorized for extractions, fractures and dislocations will include local anesthetic and routine postoperative care.

(5) Fees for impacted teeth within allowable range will be determined by authorizing officers, according to severity of impaction.

(6) Supplementary authorization for "cement base" may be authorized when recommended at a fee not to exceed two dollars.

(7) Fees for denture adjustments may be authorized when necessity therefor is not incident to the original insertion.

7. "Fact Sheet for Doctors of Dental Surgery and Dental Medicine," April 22, 1946.

a. Copies of the fact sheet, sufficient to meet estimated needs, have been forwarded to branch offices for distribution to stations within the territory under their jurisdiction.

b. If the number of fact sheets is insufficient to meet all needs, reproduction by mimeographing, multigraphing or varityping is hereby authorized in branch offices, as long as the content is not changed. Condensation or other variation of layout is not permitted. Changes in the address list on page 6 of the fact sheet are permitted insofar as to a change of address or deletion of addresses not deemed necessary.

c. Branch offices will reproduce sufficient copies to supply all VA installations within the area of its jurisdiction.

d. Requests from VA field stations for additional fact sheets will be directed to and filled by the respective branch offices.

e. Any subsequent changes, revision or rescission of fact sheet will originate in central office, and the procedure outlined in the other subheadings of this paragraph will again be followed.

8. Channeling of Correspondence.

a. In accordance with the VA decentralization program, it is mandatory for dental personnel at field stations to take up through channels all matters that have been decentralized to branch offices. This includes questions concerning transfer, promotion, grade, status, etc.

9. Rescissions.

a. Fact Sheet, January 4, 1946.

b. Administrator's letter to all hospitals, homes and regional offices, October 25, 1945, "Decentralization of Authority for Appointment, Fee Basis Physicians and Dentists" (that part pertaining to the appointment of dentists).

c. All-Station Letter dated January 17, 1942, "Absence from Duty of Dentists." (10CH)

Raise Standard Number of Dental Excavating Burs to 47

The standard number of dental excavating burs has been increased to forty-seven, effective September 1, the U.S. Department of Commerce has announced.

The increase was authorized in a revision of Simplified Practice Recommendation R195-42, a wartime limitation, which reduced standard bur numbers from seventy-five to eighteen.

Of the forty-seven numbers now approved, twelve are for shapes not in the previous issue. The other added numbers are used principally in dental colleges, or were in sufficient regular demand before the emergency to become recommended items.

Souder Heads Metrology Unit Of U.S. Bureau of Standards

Wilmer Souder, dental researcher, physicist and criminologist, has been appointed chief of the metrology division (formerly, division of weights and measures) of the National Bureau of Standards, E. U. Condon, bureau director, has announced.

At the same time, announcement was made of the appointments of I. C. Schoonover, an authority on dental materials, as chief of the dental materials section, and Peter Hidnert, also noted in the dental research field, as chief of the thermal expansion section.

New Metrology Chief

Wilmer Souder, dental researcher, physicist and criminologist, who has been appointed chief of the metrology division of the National Bureau of Standards.

Dr. Souder has been associated with the bureau for thirty-one years, during which he developed its dental and identification research laboratories.

"Such concepts as elastic limit, yield point, and thermal expansion have proved invaluable in exploring the properties of dental materials and in the introduction of new materials, such as the synthetic plastics now in use for dentures," Dr. Condon said.

Dr. Souder is a member of the International Association for Dental Research and an honorary member of the American Dental Association.

Dr. Schoonover has contributed over thirty research papers to the scientific journals on plastics, cements, alloys and waxes for dental purposes.

He is a member of the International Association for Dental Research and associate editor of the dental materials section, and a member of the Research Commission of the American Dental Association.

Dr. Hidnert has contributed to the field of thermal expansion of solids for over twenty-five years and has been active in the development of low-expanding alloys and of thermostatic devices depending on thermal expansion. He is a member of the International Association for Dental Research.

Public Health Consultants Discuss Dental Problems

The administration of dental health programs, regulations relating to federal grants to states and dental demonstration programs were under discussion July 9, when the U.S. Public Health Service consultants to state health authorities convened in Washington.

Participating consultants were F. C. Cady, N. F. Gerrie, T. L. Hagan, L. D. Heacock, J. W. Knutson, W. P. Kroschel, G. A. Nevitt and W. J. Pelton.

Dr. Pelton, newly-appointed consultant for District No. 8, took up headquarters in Denver August 1. Dr. Gerrie was recommissioned Public Health Service dental surgeon July 11 and is now on temporary assignment with the States Relations Division, Washington.

LEGISLATION

Propose Federal Department Of Health with Cabinet Status

A bill to create a federal department of "health, education and security" was introduced August 2 by Senators J. William Fulbright (D., Ark.) and Robert A. Taft (R., Ohio).

The proposal would, in effect, give cabinet status to the centralization of government activities in those fields.

House Rules Committee Blocks Cancer Research Bill

The House Rules Committee last month refused to clear for action a bill to set up a $100,000,000 program of

government research into the cause and cure of cancer.

The refusal was made on grounds that the program was so extensive it would require "more consideration."

Price of Silver Raised To 90.5 Cents by Congress

Congress on July 19 resolved the controversial silver pricing issue by setting the figure at 90.5 cents an ounce, an increase of 19.39 cents from the present price of 71.11 cents.

The 90.5 cents figure was arrived at by Senate-House conferees July 17, after the House, standing firm on maintaining the current price, had rejected a Senate proposal for 90.3 cents. The difference between the final figure and the original Senate price proposal resulted from a technical adjustment.

Under the final agreement, no silver may be purchased by the Treasury at 90.5 cents unless it has been mined within a year before the time it is offered.

ARMY AND NAVY

War Department To Recall 100 Dental Corps Officers

The War Department announced on July 29 plans to recall 100 dental corps officers, along with 1,000 army nurse corps officers and the following quotas from other corps: medical, 100; sanitary, 50; veterinary, 25; and dietitians, 25.

The recall was necessary "to insure the best possible care to some 90,000 patients in army hospitals throughout the world," Maj. Gen. Norman T. Kirk, Surgeon General, said.

In general, all officers who return to active duty must qualify for general duty and be available for overseas service, he said. As former officers, they must have an efficiency rating score of 35 to return in company grade and 40 points to return in field grade. These officers will be used to replace personnel eligible for discharge, General Kirk said.

All applicants desiring recall for extended active duty should obtain applications from the Adjutant General, Washington 25, or any army recruiting station, camp or post.

Offer Graduate Training To Army Dental Officers

A program of graduate dental education for dental corps officers has been initiated by the Dental Division, Office of the Surgeon General.

Purposes of the program are to elevate the general level of professional qualifications of dental corps officers and to provide the Army with an adequate number of qualified specialists in each branch of dentistry, according to War Department spokesmen.

The Surgeon General will exercise over-all supervision of the program and will prescribe general policies. Plans also are being made for special postgraduate courses at large permanent army hospitals, at Medical Department service schools and at civilian teaching institutions.

Approve Development Plan For Army Pathology Institute

Recommendations for future development of the Army Institute of Pathology, drawn up late last year by the Committee on Pathology of the National Research Council, Division of Medical Science, have been approved by the Surgeon General and the War Department.

The recommendations propose: (1) that a new building be constructed; (2) that the Institute be organized in four divisions — Department of Pathology, Army Medical Illustration Service, Army Medical Museum and American Registry of Pathology — each headed by a competent specialist; (3) that the staff

Photo by Press Association, Inc.

President Signs Draft Extension Act

President Truman signs into law legislation extending the draft act until next March 31, as Selective Service officials look on during the ceremony at the White House June 29. Standing are Brig. Gen. C. S. Dargusch; Maj. Gen. Lewis B. Hershey, national director; and Col. Louis Renfrow, formerly of the Dental Division, Selective Service, and now chief liaison and legislative officer.

of the Institute be drawn from both the commissioned ranks of the Army and the civilian professions; (4) that a comprehensive educational and training program be undertaken; (5) that the store of material at the Institute be used for research; and (6) that the services in pathology in the veterans' hospitals be centralized at the Institute.

Plans also are under consideration for additions to the fourteen registries (among which is the Registry of Dental and Oral Pathology) of the American Registry of Pathology. A professional scientific society wishing to sponsor a registry should communicate with the Director, Army Institute of Pathology, Seventh St. and Independence Ave., S.W., Washington 25.

With reorganization of the Army Institute of Pathology slated for completion next year, a full-time scientific director of the American Registry of Pathology will be appointed, and sufficient clerks and technicians will be available to assure adequate use of the registries for diagnoisis, research, training of young men and education of the professions.

Dental Institute Included In Army Research Center Plans

The Army plans to establish an Institute of Research Medicine and Dentistry as part of a proposed Army Medical Research and Graduate Training Center to be located at Forest Glen, Md., Maj. Gen. Norman T. Kirk, Surgeon General, announced last month.

The center, which will take approxi-

mately twelve years to construct, is planned as a consolidating point for information gleaned from all army laboratories scattered throughout the United States and Panama, General Kirk said. He emphasized, however, that the project is still in the planning stage and has not received War Department approval.

Chicago Dentist Wins Army Commendation Ribbon

Col. Arnett P. Matthews, Chicago dentist, has been awarded the Army Commendation Ribbon for "exceptionally meritorious conduct" as dental surgeon of the Sixth Service Command from July 17, 1942, to February 28, 1946.

A citation accompanying the award read in part:

> By his energy, sound judgment and foresight, he solved the many complex dental problems of the command in an outstanding manner during a period of changing organization, rapid expansion, mobilization and demobilization. He astutely evaluated the status and availability for active service of thousands of dental surgeons and with exceptional ability organized and directed the dental service of the command.

Colonel Matthews is expected to be retired from active service September 30, after thirty-four years in the Army Dental Corps.

History of Medical Department To Include Technical Section

A special clinical and technical section, designed for professional readers, will be a feature of the War Department's "Medical History of World War II," now under preparation, the Office of the Surgeon General has announced.

The section will outline clinical and technical experience of the department in dentistry, medicine, surgery and psychiatry, and in preventive, aviation, physical and veterinary medicine. Material involving operational and administrative aspects of military medicine will be eliminated except where necessary to the development of well-balanced clinical documents, the announcement said.

The clinical volumes are expected to be published at an early date to make this information available to the dental, medical and veterinary professions for application in current practice.

Other sections of the history will be (1) an eight-volume section on operation and administration of the Medical Department, which will recount its war functions; and (2) a series of medico-military monographs dealing with various specialized subjects primarily of interest to regular army officers.

Lt. Col. John C. Brauer, of the Army Dental Corps, now on inactive duty, recently was assigned to the historical division of the Office of the Surgeon General, which is preparing the work.

Seek Reserve Dentists For Naval Air Stations

In an effort to replace regular personnel, the Naval Air Reserve Training Command is seeking dental reserve officers for full-time active duty at its fifteen major air stations and for part-time active duty in the organized and volunteer components of the inactive reserve, which are based at these stations.

The fifteen stations are located at Dallas; New York; Minneapolis; Grosse Ile, Mich.; Atlanta; Glenview, Ill.; Columbus; Olathe, Kan.; Memphis; St. Louis; Livermore, Calif.; Los Alamitos, Calif.; Willow Grove, Pa.; Squantum, Mass.; and New Orleans.

Dental corps reserve officers with the rank of lieutenant are being sought for full-time active duty as members of the station keeper staffs of the air stations, Capt. G. B. Ribble, staff medical officer, Glenview Naval Air Station, said. He added, however, that quotas are not restricted to these ranks, and interested officers of any rank may apply.

Applicants should address the Bureau of Naval Personnel, via Chief of Naval Air Reserve Training, NAS, Glenview, Ill., stating the station of their preference.

WORLD DENTISTRY

Dr. Greenwald To Establish UNRRA Dental Program in China

Carl Greenwald, head of the dental division of the Chicago Board of Health, has left for China to establish a dental program there under auspices of the United Nations Relief and Rehabilitation Administration, it was disclosed last month.

Dr. Greenwald, who had been on loan to the U.S. Public Health Service, has been given the rank of lieutenant colonel. He is expected to remain in the Orient at least a year.

Central America Gets First Caries Prevention Laboratory

The first laboratory in Central America for the prevention of dental caries has been organized in Guatemala by Hermann Becks, professor of dental medicine, University of California.

The laboratory, patterned after that in the division of dental medicine at the California school, was established while Dr. Becks was at the University of San Carlos, Guatemala, during a lecture tour under the asupices of the Division of Cultural Cooperation of the Department of State.

For his work in establishing the laboratory, Dr. Beck was awarded an honorary professorship at the San Carlos university.

New Zealand Plans Free Dentistry Program

The New Zealand government has begun negotiating for free dental treatment for all high school children and adolescents, in an effort to round out a pattern of social and medical security begun by the Labor party seven years ago, it has been reported.

The negotiations with dentists are expected to bring 100,000 children under annual treatment and to extend the country's present system of dental care for public schools. The plan covers salaried service, but until it is put into operation private dentists will receive contract rates.

Aguilera Re-Elected Head Of Chilean Dental Society

Abelardo Aguilera Le-Fort has been re-elected president and Rafael Ruiz A. has been named vice-president of the Socieadad Odontologica de Chile, according to a recent announcement.

Other newly-elected officers are Olga Burgos de Pino, Ismael Carmona, Hugo Cerda P., and Alfredo Romo, directors; Dr. Carmona and Fresia Rubio, librarians; and Rene Rivadeneira, editor of the magazine, *Revista Dental de Chile.*

Re-elected officers are Alberto Ducheylard, secretary; Juan Bravo Coo, treasurer; and Juan Colin, Leopoldo Panatt and Dra. Rubio, directors.

New York Dentist Leaves For Mission in Europe

David B. Ast, chief of the dental bureau of the New York State Health Department, has left for Europe, where he will aid in the dental rehabilitation of displaced persons under the direction of the American-Jewish Joint Distribution Committee. He is on leave of absence from the Health Department.

National Dental Congress Plans November Meeting

The "II Congreso Dental Nacional," newly-formed scientific congress, will be held in Havana sometime in November, Carlos A. Criner G., president of the organization committee, has announced.

The Congress, the first such gathering to be held since 1911, will afford an interchange of scientific and professional information among professional men, Dr. Criner said. The Congress was authorized at a recent meeting of the "VII National Stomatological Assembly," in Cardenas, Cuba.

Study of Procaine Dermatitis Among Dentists Under Way in Canada

The department of dental surgery and anesthesia of the faculty of dentistry of the University of Toronto is conducting a survey to determine the number of dentists suffering from procaine dermatitis.

Dentists afflicted with this condition who wish to aid in the study can cooperate by sending the following information to J. H. Johnston, 230 College St., Toronto, Ontario, Canada: date of onset, number of years in practice prior to onset and any other pertinent information.

Indian Dental Review Resumes Publication

The *Indian Dental Review*, quarterly journal founded in 1927, has resumed publication after a wartime lapse of four years, Mansookh K. Patel, editor, announced last month.

The publication contains "scientific and constructive material and a review of world progress in dental science, education, literature and industry" for the benefit of the dental profession in India, Burma and Ceylon, Dr. Patel said.

Offices are at 7 Patel Chambers, Victoria Road, Karachi, India.

DENTAL SCHOOLS

University of Texas Plans Expanded Dental Branch

The University of Texas is planning erection of a dental branch building as one of four major institutions which it will sponsor within the proposed Texas Medical Center at Houston.

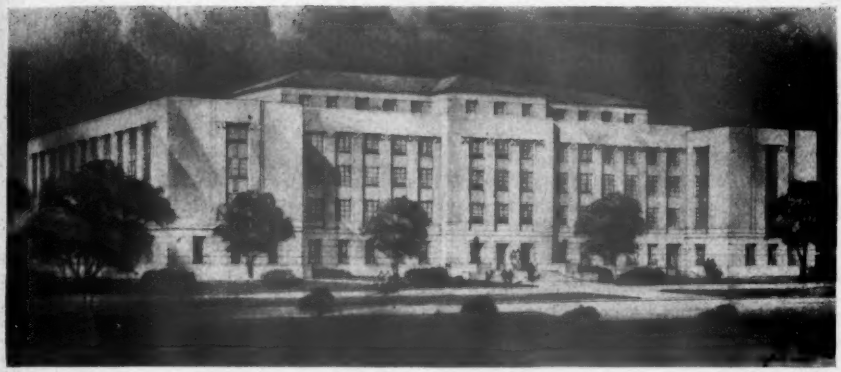
Frederick C. Elliott, dean of the School of Dentistry, University of Texas, which will be housed in the Texas Medical Center, Houston. Dr. Elliott recently was named a vice-president of the university.

The dental branch will be expanded when it is moved into the Center. Its dean, Frederick C. Elliott, recently was named a vice-president of the university in a move to equalize the dental and medical branches.

The Medical Center will house four universities, twelve hospitals and several research institutions within a 163-acre area adjoining Hermann Park. Also near by are a $10,000,000 navy hospital, now under construction, and the probable site of an $8,000,000 veterans' hospital.

Units to be sponsored by the University of Texas, in addition to the dental branch, are: (1) the M. D. Anderson Hospital for Cancer Research; (2) the Preceptorial Training Center; and (3) the School of Public Health. All four units will be integral parts of the center, but will be autonomous in relation to other units and will remain responsible solely to the university.

The dental branch will contain the following divisions:



Proposed Dental Branch, University of Texas

Preliminary study of the building which will house the dental branch of the University of Texas in the proposed Texas Medical Center at Houston. The sketch was prepared by Robert Leon White, university architect.

1. The Dental School, which will provide facilities for between 240 and 300 undergraduate students.

2. The College of Dental Nursing, which will train between 100 and 150 young women yearly in the specialized field of dental nursing.

3. The Institute of Orthodontics, which will serve as a research center for the study of jaw and facial deformities.

4. The Postgraduate and Graduate School of Dentistry and Stomatology, which will train between 100 and 150 graduate dentists and physicians, coming to the graduate school for special studies, and will offer courses leading to graduate degrees in the various specialties of dentistry.

In addition to the institutions of the University of Texas, other units now planned for the center include: the Medical School of Baylor University, the Hermann Hospital, the Methodist Hospital, the Convalescent Hospital, the Children's Hospital, the Urological Hospital and the Medical Center Central Clinic.

Fostered by the M. D. Anderson Foundation and now chartered as a separate corporation, the Texas Medical Center, Incorporated, proposes to furnish to all institutions within its bounds such services as the operation of a central power and heating plant and a common laundry. Also planned is the erection and operation of a $500,000 library under the sponsorship of the Houston Academy of Medicine.

Illinois University To Offer Graduate Course in Pedodontics

The College of Dentistry, University of Illinois, will offer a graduate course in pedodontics beginning September 9 and extending over three quarters on a full-time basis.

The course will feature training in basic technics and basic sciences, both under the supervision of Allan G. Brodie, head of the Department of Orthodontia. In addition, there will be clinical practice, which will rotate among normal children entering the dental school clinic, hospitalized children and institutionalized children.

Further information can be obtained by addressing Maury Massler, College of Dentistry, University of Illinois, 808 South Wood St., Chicago 12.

GENERAL NEWS

United Nations Draws Up World Health Organization

Culminating a five-week session in New York, delegates from sixty-one nations on July 22 completed work on the constitution of the new World Health Organization.

In a speech delivered at signing ceremonies, Thomas Parran, Surgeon General of the U. S. Public Health Service, who served as president of the conference, defined the organization as "a collective instrument which will promote physical and mental vigor, prevent and control disease, expand scientific health knowledge and contribute to the harmony of human relations."

The World Health Organization will direct the functions of existing intergovernmental health agencies. It will assume the functions of the League of Nations Health Organization, of l'Office International d'Hygiene Publique and the epidemiologic intelligence functions of the Health Division of the United Nations Relief and Rehabilitation Administration. In addition, it will integrate the Pan-American Sanitary Bureau as a regional office.

Any urgent health problems that may arise before the organization gets under way, plus the actual work of setting up the organization, are being handled by an interim commission, which will meet every fourth month. Nations elected members of the commission are the United States, Egypt, Canada, Norway, Venezuela, the Netherlands, China, the United Kingdom, France, Brazil, the Soviet Union, Yugoslavia, India, Peru, Australia, Mexico, Liberia and the Ukraine.

Provisional budget estimates of $300,000 for 1946 and $1,000,000 for 1947 were adopted by the interim commission's committee on administration and finance and will be submitted to the Secretary General of the United Nations.

The next meeting of the interim commission will be held at either Geneva or Paris in the fall.

House of Commons Passes British National Health Plan

The British House of Commons on July 26 approved and sent to the House of Lords the National Health Service Bill, which would establish free medical, hospital and nursing service, ranging from major operations to household medicines, beginning in 1948.

Aneurin Bevan, minister of health, appealed to physicians for their cooperation, without which, he asserted, the plan was "bound to fail." The British Medical Association repeatedly has voiced opposition to the proposal.

Members of the Conservative opposition at the same time argued that the plan would deprive physicians of their "freedom and independence" and would centralize too much power in the health minister.

Under the plan, fees, salaries and other expenses incurred in a patient's illness would be paid by the government, but those who desired might buy extra comforts or consult and pay independent physicians.

War Department Releases Medical Films to Professions

Professional medical motion picture films produced for use by the Surgeon General are now available for loan to the medical or allied professions, the War Department announced last month.

A list and synopsis of subjects available, and copies of the application form for loan of prints, can be obtained by writing the Surgeon General, Attention: Chief, Education and Training Service, The Pentagon, Washington 25.

New Endodontia Organization Publishes Quarterly Journal

The American Association of Endodontists, newly-formed dental organization, has begun publication of a quarterly magazine, *Journal of Endodontia*, according to a recent announcement.

The publication is edited by Balint Orban, Chicago, with the aid of the following committee: Louis I. Grossman, Philadelphia, chairman; P. E. Blackerby, Jr., Battle Creek, Mich.; and E. A. Jasper, Milwaukee.

DENTAL PATENTS

Patent Forty-Three Devices of Interest to Dentists In Six-Month Period, January 1 Through June 30

A total of forty-three devices of interest to the dental profession were patented in the six-month period, January through June. Following is the list of patents issued by the U. S. Patent Office during that time:

		January 1
2,391,925	Jacob A. Saffir	Artificial Tooth
2,392,104	Jesse Conrad Smith	Fabricated Glass Article and Method
2,392,109	Mark Vlock	X-Ray Film Packet Holder and Angle Indicator
2,392,196	Arthur E. Smith	Syringe
		January 8
2,392,513	Edward W. Town	Cushion for Artificial Dentures
		January 15
2,392,929	Pyungtoo W. Lee	Manufacture of Artificial Teeth and Other Molded Articles
2,393,143	Sylvia C. Carwile	Shield for Medicinal Needles
		January 22
2,393,336	Jack N. Lane	Anesthetic Mask
		January 29
2,393,751	George A. Chott	Method of Making Dental Polishing Tools
		February 12
2,394,640	Henry Singer	Attachment for Toothbrushes
2,394,659	John Breyer	Artificial Tooth and Anchor Therefor
2,394,687	George N. Hein	Syringe with Adjustable Piston Construction
2,394,921	John Lehner	Dental Deflasking Mechanism
		February 19
2,395,241	Frank Allen	Means for Curing Artificial Dentures
		February 26
2,395,538	David Curtis	Anesthetic Salts of P-Aminobenzoid Acid Esters
D-143,987	Edwin O'Donnell	Design for a Dental Occlusion Apparatus
		March 5
2,396,192	John D. Morgan	Dental Instrument Lubricant
2,396,203	David S. Robinson	Gum Clamp

March 12

2,396,311	David J. Binus	Door Apparatus for Dental Units and the Like
2,396,548	Dane R. Allen	Toothbrush
2,396,619	Edward Ray Strayer	Orthodontic Implement

March 19

D-144,163	Meyer E. Dolnick	Design for a Toothbrush

March 26

2,397,143	Homer van Beuren Joy	Barium Bromate Impression Material
2,397,144	Eugene J. Molnar	Sulphide Impression Material
2,397,145	Homer van Beuren Joy	Impression Material
2,397,264	Nelson Ingersoll, Jr.	Duplicating Flask for Dental Models
2,397,407	Fabius M. Butler	Artificial Tooth
D-144,275	Anna E. Vandeventer	Design for a Combined Toothbrush, Dentifrice Container and Brush Sheath

April 2

2,397,648	Jacob Clem Butler	Splint
2,397,823	Carl W. Walter	Forceps

April 9

D-144,385	Samuel Katz	Design for a Foldable Toothbrush

April 16

2,398,544	Marshall L. Lockart	Hypodermic Injector
2,398,671	Jacob A. Saffir	Artificial Tooth and Mount Therefor

April 23

2,398,923	Llewellyn M. Dahl	Combination Dental Diagnosis and Office Desk

April 30

2,399,231	Philip I. Klein and Aaron Z. Shevsky	Dental Instrument

May 7

2,399,660	Marcel Boulicault	Teeth Cleaning Unit
2,399,834	Charles Seltzer	Dental Tool
D-144,607	William J. Charters	Design for a Dental Stimulating Instrument

May 14

2,400,172	Ivar E. Siqveland	Matrix Clamp

May 21

2,400,722	Harry L. Swan	Hypodermic Needle Case

May 28

2,400,912	Vernon E. Britt and Ernest A. Goetze	Dental Appliance

June 18

2,402,259	Jacob A. Saffir	Artificial Tooth
2,402,306	Henry Turkel	Retaining Guard for Needles

REPORTS OF COUNCILS AND COMMITTEES

COUNCIL ON DENTAL THERAPEUTICS

ISOPROPYL ALCOHOL

Harold C. Morris, B.S., and Carl A. Dragstedt,* Ph.D., M.S., B.S., Chicago*

Owing to wartime shortages of methyl alcohol and to high tax levies on that product, isopropyl alcohol has found increasing use in dentistry for disinfecting instruments and other purposes. At the request of the Council on Dental Therapeutics, the following article has been prepared to describe the properties, toxicity and possible dental uses of isopropyl alcohol as a substitute for methyl alcohol.

The threatened shortage of ethyl alcohol during the war years, occasioned by its critical importance in the munitions industries, has reawakened interest in isopropyl alcohol as a substitute for it in some of the many applications that ethyl alcohol has in the medical, dental and pharmaceutical fields.

Isopropyl alcohol, $CH_3.CHOH.CH_3$ (also called isopropanol, secondary propyl alcohol, dimethylcarbinol and petrohol), resembles ethyl alcohol in many respects but has an unpleasant odor and taste so that it is considered nonpotable. In the United States it is obtained as a by-product of the petroleum and natural gas industries. It can be prepared by the reduction of acetone and it occurs as a component of fusel oil as it is formed in the fermentation of potato mash by the organism Clostridium Americanum.[1]

The important physical properties of isopropyl alcohol are as follows:

Boiling point	82.5° C.
Melting point	—86.0° C.
Flash point	14.0° C.
Specific gravity	0.783 at 25.0° C.
Miscible with water, alcohol and ether	

It is marketed as the constant boiling point mixture, which contains 91.1 per cent isopropyl alcohol by volume, boils at 80.4° C. and has a specific gravity of 0.8158. Commercially it is used as a solvent for shellac, gums, resins and oils and for various purposes in the perfume and cosmetic industries.

Applications

In view of its similarity to ethyl alcohol, its presumptive applications in medical, dental and pharmaceutical fields would be as a solvent or vehicle for drugs for internal administration or external application, as a disinfectant for syringes, hypodermic needles and instruments, as a disinfectant application to the skin and accessible mucous membranes and as a hardening and astringent application to the skin. Of paramount importance in the consideration of its applicability to these fields of use is the question of toxicity, both acute and chronic, general and local.

Acute Toxicity

The acute toxicity of isopropyl alcohol has been studied by a number of workers (Macht,[2] Grant,[3] Desjardin-

*Department of Pharmacology, Northwestern University, Medical School.

The Council on Dental Therapeutics has authorized publication of this report as one of the series on pharmacology and therapeutics. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council.

1. Pringshiem, H.: Ueber den Ursprung des Fuseloels, etc. Centrabbl. f. Bakteriol. 15:300, 1905.

2. Macht, D. I.: Pharmacological Examination of Isopropyl Alcohol. Arch. Internat. de pharmacodynam et de therap. 26:285, 1921.

3. Grant, D. H.: The Pharmacology of Isopropyl Alcohol. J. Lab. and Clin. Med. 8:382, 1923.

Beaumetz and Audige,[4] Burton-Opitz,[5] Morris and Lightbody[6] and Lehman and Chase.[7] There is rather general agreement that the symptomatology produced in experimental animals (cats, dogs, rats and rabbits) is similar to that produced by ethyl alcohol and that the acute toxicity is approximately twice that of ethyl alcohol, irrespective of whether the two are given by mouth or by subcutaneous or intravenous injection. For example, the recent observations of Lehman and Chase[7] indicate that the LD50* in dogs after oral administration is 12.25 cc. per kilo for ethyl alcohol and 6.15 cc. per kilo for isopropyl alcohol.

Chronic Toxicity

That the subacute or chronic toxicity of a potential substitute for ethyl alcohol is likewise of great importance is proved by the experience with methyl alcohol. The latter is no more toxic than ethyl alcohol as judged by acute experiments but its actual hazard is much greater because it is disposed of very slowly (thus permitting cumulative effects from successive doses) and because it is oxidized in part to formaldehyde and formic acid which may play a role in the optic atrophy and blindness so conspicuous a feature of methyl alcohol poisoning. The hazard of methyl alcohol is such that its presence in foods and drugs is prohibited by law and protection against exposure to its vapor is essential in many industries. Information concerning the rate and nature of the metabolism of isopropyl alcohol is of importance, therefore, in connection with studies as to the subacute or chronic hazard from isopropyl alcohol. Lehman, Schwerma and Rickards[8] report that isopropyl alcohol is disposed of quite rapidly, its disposal consisting of excretion as such and, in part, of oxidation. Acetone has been reported to be an oxidation product[9] but if so does not appear to be formed in sufficient amount to occasion alarm. Many of the workers who have studied the acute toxicity of isopropyl alcohol have likewise studied the effects of its continued administration. Lehman, Schwerma and Rickards[8] have studied this aspect quite extensively and report that the ingestion of large amounts of isopropyl alcohol by dogs at regular daily intervals failed to produce any evidence of cumulative action or to produce toxic effects ascribable to some metabolic oxidation product. They also report that the continued voluntary drinking of 2.5 per cent isopropyl alcohol through two successive generations of white rats produced no effect on reproductive functions or embryonic development. Fuller and Hunter[9] administered isopropyl alcohol (20-30 cc. doses in 50 per cent concentration) to seven human subjects for a number of days and noted no evidence of visual impairment.

Summary

Isopropyl alcohol does not appear to present any peculiar hazard such as does methyl alcohol and its toxicity (considered to be about twice that of ethyl alcohol) is not of such magnitude as to preclude a reasonable use. Thus it would seem to be safe enough in mouthwashes, gargles, dentifrices, etc., where the likelihood of substantial quantities being swallowed is minimal. Its objectionable odor and taste are probably more important in restricting its employment along such lines than is its toxicity.

4. Desjardin-Beaumetz and Audige: Reserches Experimentales sur la Puissance Toxique des Alcools. Paris: Octave Doin, 1897.

5. Burton-Opitz, R.: L'action de l'alcool isopropylique sur la force fonctionelle du coeur. Arch. Neerland Physiol. de l'Homme at des Animaux. 7:157, 1922.

6. Morris, H. J., and Lightbody, H. D.: The Toxicity of Isopropanol. J. Indust. Hyg. and Toxicol. 20:428, 1938.

7. Lehman, A. J., and Chase, H. F.: Acute and Chronic Toxicity of Isopropyl Alcohol. J. Lab. and Clin. Med. 29:561, 1944.

*Lethal dose in 50 per cent of laboratory animals.

8. Lehman, A. J.; Schwerma, H.; and Rickards, E.: Isopropyl Alcohol: Acquired Tolerance in Dogs, Rate of Disappearance from the Blood Stream in Various Species and Effects on Successive Generation in Rats. J. Pharmacol. and Exper. Therap. 85:61, 1945.

9. Fuller, H. C., and Hunter, O. B.: Isopropyl Alcohol: An Examination of its Physiologic Properties. J. Lab. and Clin. Med. 12:326, 1927.

Local Action

The local action of isopropyl alcohol has likewise been studied. Macht[2] applied isopropyl alcohol to the skin of cats at daily intervals and noted neither irritation of the skin nor effect on hair growth. Sinclair[10] applied bandages soaked in isopropyl alcohol to the arms of five human subjects for four daily periods aggregating twenty-one hours for each subject. No harmful effects, either systemic or local, were noted. Sinclair also reported that he took daily sponge baths in 30 to 50 per cent isopropyl alcohol, which he found to be cleansing and without irritating effects. That it is somewhat irritating to mucous membranes (and to about the same degrees as ethyl alcohol) is indicated by the observations of Fuller and Hunter[9] who noted a gastro-enteritis in experimental animals after its repeated oral administration.

These observations indicate that it could substitute for ethyl alcohol as a massage medium (e.g., liniment vehicle) or skin hardening agent in a fairly satisfactory way. It cannot, however, be called "rubbing alcohol" as this term is restricted by the Food and Drug Administration to preparations of ethyl alcohol.

Antiseptic Properties

Its antiseptic properties are of interest in view of the extensive employment of ethyl alcohol as a skin disinfectant and as a rapid means of disinfecting instruments, syringes, etc. This problem has been studied by a number of investigators with respect to many different kinds of organisms. The prevailing view is expressed in a recent report by Powell,[11] who states that it is equal to or even superior to ethyl alcohol in antiseptic action. It kills nonsporebearing bacteria, both gram positive and gram negative, quite rapidly, but does not kill the sporebearers. He concludes: "It appears that the antibacterial potency of isopropyl alcohol is adequate for aseptic preparation of syringes, needles, etc. (instruments not harmed by alcohol) for safe human use. Absolute bacteriological sterility cannot be guaranteed with any procedure short of autoclaving; however, devitalization of vegetative bacteria can be attained rapidly through the use of isopropyl alcohol in a practical way. This action amounts to clinical asepsis but not bacteriological sterility." It has been shown that ethyl alcohol has its highest antibacterial potency in a concentration of 70 per cent by weight. It appears that isopropyl alcohol, at equal concentrations, is more potent than ethyl alcohol but it is not possible to state its most potent concentration in such precise terms. Bernhardt[12] recommends that it should be used in a concentration of 50 per cent when used on dry skin and about 70 per cent when used on moist skin.

Conclusions

Isopropyl alcohol would appear to be a useful substitute for ethyl alcohol in some respects but not in others. Its toxicity plus its unpleasant odor and taste would appear to preclude its use as a vehicle for the systemic administration of drugs but not for those preparations (gargles, dentifrices, etc.) where little would be swallowed. It could be used instead of ethyl alcohol as a liniment vehicle, skin cleansing agent, etc., without apparent risk. It could substitute for ethyl alcohol as a disinfectant agent for instruments, syringes and needles and as a disinfecting application on the skin. It appears to be too irritating to use as a disinfecting agent on extensive mucous surfaces.—*303 East Chicago Avenue.*

10. Sinclair, J. M., cited by Grant, D. H., and Johns, C. I.: Isopropyl Alcohol. Am. J. Pharm. 94:418, 1922.

11. Powell, H. M.: Antiseptic Properties of Isopropyl Alcohol in Relation to Cold Sterilization. J. Indiana State Med. Assoc. 38:303, 1945.

12. Bernhardt, G.: Ueber Isopropylalkohol als mittel zur Hoendedisinfektion. Deutsch. med. Wchnschr. 48: 68, 1922.

MONOCAINE 1½% WITH EPINEPHRINE 1:100,000—ACCEPTABLE FOR A.D.R.

At its annual meeting, April 5 and 6, 1946, the Council on Dental Therapeutics considered the currently available evidence with regard to Monocaine HCl, including certain recent publications.[1, 2]

It was decided that several dosage forms of the 1½ per cent concentration of this product would be accepted when the firm had met the following provisions:

1. The following statement is placed in an easily readable form on all trade packages: "Directions for Use: The concentration of anesthetic agent in this product is greater than that required for routine use. Use only when anesthesia is difficult to obtain. Do not inject intravenously."

2. The product has met the requirements of the A.D.A. Bureau of Chemistry.

3. All proposed advertising to dentists has been submitted by the firm and passed upon favorably by the Council referee.

The firm has indicated its willingness to meet the provisions of acceptance and recent samples of the product have been examined in the A.D.A. Bureau of Chemistry. Acceptance of the following dosage forms is therefore announced:

Monocaine HCl 1½%, Epinephrine 1:100,000: Each cubic centimeter is stated to contain monocaine hydrochloride, 0.015 gm.; epinephrine, 0.00001 gm.; sodium bisulfite, 0.002 gm.; sodium chloride, 0.0045 gm.; and distilled water. Marketed in anestubes (1 cc., 1.8 cc., 2.3 cc., 5 cc.), Novampuls (2.5 cc., 5 cc.), ampuls (2 cc., 3 cc., 5 cc.) and bottles (1 ounce, 2 ounces and 4 ounces). Manufactured by Novocol Chemical Mfg. Co., Inc., Brooklyn, N. Y.

1. Beutner, R.: The Cardiac Toxicity of Injectable Local Anesthetics. Fed. Proc., Part II. 5:166, February 1946.

2. Beutner, R., and Dietrich, W. C.: The Blood Pressure Lowering Effect of Local Anesthetics Used for Injection. Fed. Proc., Part II. 5:167, February 1946.

PERIODON—NOT ACCEPTABLE FOR A.D.R.

Many inquiries received in the office of the Council on Dental Therapeutics prompt a report on Periodon, marketed by the Barnes-Hind Laboratories, San Francisco. The firm's reply to an inquiry from the secretary professed a willingness to cooperate with the Council. However, the firm's promotional activity in the absence of adequate supporting evidence raises several questions.

The name of the product, Periodon, is not acceptable, being in violation of Rule 8.

The composition of Periodon is reported by the firm to be as follows:

Carbonyldiamide Peroxide (Urea Peroxide)	50 per cent
Carbonyldiamide (Urea)	27 per cent
Sodium Lauryl Sulfate	2 per cent
Anhydrous Sodium Sulfate	21 per cent

The firm calls attention to the danger of explosion in the compounding of the mixture and in its use with other chemicals which might act as catalytic agents. No statement of caution on this point appears on the bottle label or package enclosure.

The product is promoted for both chair-side and home use. A claim for absence of irritation incident to its use

The Council on Dental Therapeutics has authorized publication of this report.

is made and then contradicted by a warning to stop its use when signs of irritation develop.

Rationale for the mixture is claimed, in part, on the basis of articles by Dunlop,[1] Mallett[2] and Orban[3, 4] on oxygen therapy. These reports are not convincing that oxygen therapy has merit in the treatment of periodontal disease. An understanding of the causation and pathologic processes in periodontal disease makes it quite clear that claims for therapeutic merit for oxygen rest on questionable grounds.

The rationale for the use of urea in periodontal therapy is claimed on evidence not directly related to periodontal considerations. One of the cited articles, by Holder and MacKay,[5] deals with urea therapy in healing. No periodontal application appears in this article. Reports by Stephan[6] and by Wach, O'Donnell and Hine[7] deal with the use of urea in connection with the problem of dental caries. How the latter reports support the use of urea in the treatment of periodontal diseases is not stated by the firm. Emphasis by the firm on the use of urea and ammonium carbonate in connection with the control of dental caries raises the suspicion that the firm intends Periodon to be used indiscriminately.

A preliminary report on investigative work intended to support claims for usefulness of Periodon in periodontal therapy is submitted by the firm. This work is reported by James Nuckolls, professor of operative dentistry, University of California. The report is limited to four cases. The observations as presented in this preliminary report appear to be inconclusive.

Circulars issued by the firm claim Periodon to be ". . . of proven value in the treatment of pyorrhea and Vincent's infection." It is further claimed that "the value of urea in periodontal therapy is now well established." These claims are inadequately supported and unwarranted. The Council on Dental Therapeutics, in this case as in all instances, will continue to evaluate evidence which may come to its attention.

1. Dunlop, W. F.: Pyorrhea and Its Treatment. Chicago: Dunlop Research Inst., 1913.
2. Mallett, S. P., and Guralnick, W. C.: Zinc Peroxide in Treatment of Mouth Infections. J.A.D.A. 29:384, March 1942.
3. Orban, Balint: Action of Oxygen on Chronically Inflamed Gingival Tissue. J.A.D.A. 29:2018, November 1, 1942.
4. Orban, Balint: Treatment of Pyorrhea. Ztschr. f. Stomatol. 30:61, 1932.
5. Holder, H. G., and MacKay, E. M.: Application of Urea Therapy in Healing. Ann. Surg. 110:94, July 3, 1939.
6. Stephan, R. M.: Use of Urea in Mouth Rinse to Control Dental Caries. Science 92:578, December 20, 1940.
7. Wach, E. C.; O'Donnell, J. R.; and Hine, M. K.: Effects of Mouth Rinse on Oral Acidogenic Bacteria. J.A.D.A. 29:61, January 1942.

NOTICE OF JUDGMENT

1440. Misbranding of Hall's Canker Remedy. U. S. v. 69 Bottles of Hall's Canker Remedy. Default decree of condemnation and destruction. (F.D.C. No. 13203. Sample No. 73739-F.)

On August 9, 1944, the United States attorney for the Southern District of California filed a libel against sixty-nine three-ounce bottles of the above-named product at Los Angeles, Calif., alleging that the article had been shipped on or about April 27, 1944, from Salt Lake City, Utah, by the Hall's Canker Remedy.

Examination showed that the article consisted essentially of zinc sulfate, borax, sugars and water.

The article was alleged to be misbranded in that the label statements, "Canker Remedy * * * aids in the treatment of Canker, Simple Sore Throat, and all minor mouth * * * Ir-

ritations * * * if the canker is not relieved, repeat dose as before. Most cases are usually remedied in nine doses," were false and misleading since the article would not be effective in the treatment of canker, simple sore throat and all minor mouth irritations.

On August 31, 1944, no claimant having appeared, judgment of condemnation was entered and the product was ordered destroyed. Issued May 1946.

ACCEPTED DENTAL REMEDIES

The Council on Dental Therapeutics of the American Dental Association announces the inclusion of the following products in the list of Accepted Dental Remedies:

Barbiturates[1]

Hexobarbital.—This drug, which is listed in the British Pharmacopeia, is N-methyl-cyclohexenyl-methyl-barbituric acid. It is marketed in the United States under the proprietary name of Evipal, as well as the nonproprietary name, hexobarbital.

Properties: Hexobarbital is a white, odorless crystalline powder with a faintly bitter taste. It is soluble in about 3,000 parts of water at 20°C., and in alcohol, methyl alcohol, acetone, benzene, chloroform, ether and aqueous solutions of alkali hydroxides, but not in solutions of alkali carbonates.

Actions and Uses: Its action is similar to that of other slightly soluble barbiturates except for the duration of its effect, which is relatively short. It is useful in small doses as a sedative during the day or in larger doses to induce sleep.

Dosage: As a sedative, 0.13 or 0.26 gm. (2 to 4 grains); as a hypnotic, 0.26 to 0.39 gm. (4 to 6 grains).

Tests for identity and purity are described in N.N.R. and in the British Pharmacopeia, 1932, third addendum.

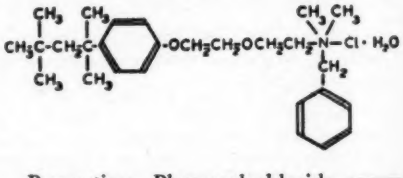
Hexobarbital Tablets: Each tablet contains hexobarbital, 0.26 gm. (4 grains) and magnesium oxide, 0.042 gm.

1. A.D.R., Ed. 11, p. 66.

Distributed by Cook-Waite Laboratories, Inc., New York.

Ammonium Compounds[2]

Phemerol Chloride [p-(2-methyl-4, 4-dimethyl pentano-2) (phenoxy-ethoxy-ethyl)] dimethyl benzyl ammonium chloride monohydrate. — $C_{27}H_{42}O_2NCl.H_2O$ M.W. 466.09. Phemerol chloride has the following structural formula:



Properties: Phemerol chloride occurs as colorless, odorless crystals possessing a very bitter taste. By the addition of ether, it may be recrystallized from a chloroform solution in the form of very thin plates, which may assume a hexagonal shape. These crystals possess a high birefringence, parallel extinction and positive elongation, and are biaxial with refractive indexes of 1.580 and 1.560. These crystals and the original material sinter slightly on the hot stage at 120°C., and melt at 164-166°C. The pH of a 1 per cent solution of phemerol chloride is between 4.8 and 5.5. Mineral acids and many salt solutions precipitate phemerol chloride from solution more concentrated than 2 per cent as an oil which crystallizes on drying and has the same properties as phemerol chloride.

2. A.D.R., Ed. 11, p. 30.

A solution of phemerol chloride yields a flocculent white precipitate with soap solutions.

Actions and Uses: Phemerol chloride is used in the form of tincture and aqueous solution as a general purpose antiseptic.

For further tests of identity and purity, see N.N.R.

Manufactured by Parke, Davis & Company, Detroit.

Solution Phemerol Chloride 1:1,000 (Aqueous): Phemerol chloride, 0.1 per cent in water containing 1 per cent sodium bicarbonate.

Tincture Phemerol Chloride 1:500: Phemerol chloride, 0.2 per cent, in alcohol, 65 per cent; acetone, 10 per cent; plus water and color.

Admission of a product to the list of Accepted Dental Remedies means that the product and the methods by which it was marketed at the time of consideration were not found to be in violation of the Council's published rules. Accepted products are reconsidered periodically. The files of the Council contain information on many drugs and dental cosmetics which is available upon request, and inquiries are welcomed.—*Donald A. Wallace, Secretary.*

THE LIBRARY BUREAU

All of the members of the American Dental Association are entitled to use the library of the American Dental Association. In order to meet the needs of an ever-expanding membership, both the services offered and the facilities provided are somewhat unusual. The Library Bureau is, of course, primarily a library, but, in addition, it is an information center, a bookstore and, to many dentists, a source of contact with the Central Office of the American Dental Association.

The library of the American Dental Association was officially started in March 1927. Prior to that time, the book collection consisted of books presented to the Association by authors, books sent to THE JOURNAL for review and periodicals that had been bound. This collection was used occasionally by members of the profession, but, since it was only partially catalogued and since no one was officially designated to take care of the requests for books or to see that the books which were borrowed were returned, the service was not too satisfactory. In 1927, a librarian (the present one) was engaged and two primary types of service were started. These consisted of loans of books and compilations of magazine articles into so-called "package libraries."

For many years the book collection grew slowly not only because sufficient space was not available to encourage rapid growth but also because the requests for package library material had become so numerous that the librarian had to concentrate primarily on taking care of these requests rather than on increasing the size of the book collection. Since the American Dental Association has moved to its present address, the library has a modern and colorful reading room of adequate size containing the newer books. There is a regular stack room for the older books and for the bound volumes of magazines, and a supplementary stack room for the unbound copies of magazines, a necessary adjunct to the package library service.

Emphasis has been placed on acquiring current literature of practical value rather than items of value because of their rarity or historical interest. At least one copy of each new book on den-

Read at the meeting of the Georgia State Dental Association, May 14, 1946.

tistry is procured as soon as it is published, and additional copies are obtained as the need dictates. Books on anatomy, anesthesia, diagnosis, dietetics, economics, medicine, surgery and therapeutics are also purchased when recommended, making a well-balanced library.

The library now contains approximately 6,000 bound volumes which have been catalogued and more than 4,000 package libraries consisting of about 150,000 articles on approximately 375 distinct phases of dentistry. In addition, there are many thousand unbound pamphlets, reprints and periodicals. The periodicals are available for clipping purposes and are also given to libraries which need them to complete their files. So far as is known, all of the dental journals in the English language published throughout the world are received by the Library Bureau. In addition, magazines pertaining to anesthesia, surgery, dietetics, public health, public health nursing, physical therapy, medicine and many other subjects are procured through subscription or exchange. Approximately 135 dental journals and seventy-eight other journals, all in the English language, are received in the library, and also eighty-one journals in foreign languages are coming in regularly since the end of the war.

The library, when it was started, was intended primarily to aid dentists in small communities who did not have access to the usual library facilities. In reality, however, the library is used principally by dentists who are writing books or articles or giving clinics, many of whom have access to the finest libraries. Although the majority of requests for service are received from regular members of the American Dental Association or from junior members, many requests come from dental hygienists, dietitians, physicians, laboratory technicians, dental manufacturers, public health workers and teachers. An average of 500 applications for service are received each month. Particularly at this time many requests are coming from outside the United States as countries which were shut off during the war are now making inquiries about books and periodicals. For instance, during the battle for the liberation of the Philippines the dental school of the university in Manila was completely demolished and all of the books destroyed. The dental school is now being conducted in the Philippine General Hospital with reading material which has been furnished by this library. Each week since early fall a package library on a subject selected by the director of the school has been sent to Manila and a number of books have been donated.

The types of material requested vary from time to time. During the war information on fractures of the mandible, dentistry in relation to aviation, anesthesia, etc., was greatly in demand. With the ending of hostilities, the topics of interest changed almost overnight, and information on such subjects as impression taking, immediate denture service, technics, dental offices and the training of dental assistants was most frequently requested. Fluorine therapy and penicillin are about the only topics on which information has been steadily requested, and all of the material on these two subjects is usually in circulation.

It is necessary for this library to differ from other libraries because most of the dentists who use the library make their contacts with it by mail or phone and have material sent to them rather than come to the library in person. The books from this library circulate much as they would from any dental library, but the periodical literature is supplied largely by means of the package library. These packages consist of clippings and reprints on highly specialized phases of dentistry and are particularly useful to men who are writing papers or giving clinics or who have some special problem in practice. The average package library

contains about thirty articles in clipping or reprint form and represents a cross-section of the literature. Since each article contains the name of the magazine from which it was taken and also the volume, page, month and year of publication, it is quite simple to compile a bibliography from a package library if it is necessary to do so.

Even the dentist who is not in the habit of using a library may occasionally turn to the library for help on specific problems. Perhaps he may wish to obtain information on training a new assistant or planning a dental office, or he may wish to locate an article that he has clipped from a magazine and mislaid. In the preparation of a paper, the dentist may wish to review the literature on the subject before making his contribution. If he wishes to purchase books, he can obtain unbiased information from the Library Bureau as to which books are most popular, or he can borrow circulating copies of several books on a subject to compare them before making a selection.

Lists of new books and of the package libraries, including regulations for borrowing material, are now available to all members upon request.—*Josephine P. Hunt, Librarian.*

COUNCIL ON DENTAL HEALTH

SUMMARY OF THE TAFT-BALL-SMITH HEALTH BILL (S.2143)

During the Senate Education and Labor Committee hearings on the Wagner-Murray-Dingell bill (S.1606-H.R.4730) Senator Taft announced that he was preparing and would soon introduce a health bill as a counter measure to the Wagner-Murray-Dingell bill.

On May 3, 1946, the Taft-Ball-Smith health bill (S.2143) was introduced in the Senate. This bill embodies broad proposals for a national health program, including certain dental provisions. Unlike the Wagner-Murray-Dingell bill the new proposal does not contain provisions of any kind to establish a national prepayment or insurance system. Its basic approach is to combine the federal health agencies, to make grants available to the states for medical and dental service which would be restricted to low income families and to expand research and training of health personnel.

It is not the purpose here to evaluate the merits or shortcomings of the Taft-Ball-Smith health bill. Instead, this summary has been prepared with the view of eliminating the legal phraseology as much as possible and in order that the essential provisions may be analyzed.

The Taft-Ball-Smith health bill (S. 2143) proposes: "To coordinate the health functions of the federal government in a single agency; to amend the Public Health Service Act for the following purposes: To expand the activities of the Public Health Service; to promote and encourage medical and dental research in the National Institute of Health and through grants-in-aid to the states; to construct in the National Institute of Health a dental research institute and a neuropsychiatric institute; and for other purposes."

The bill, when enacted, would be known as the "National Health Act of 1946."

The bill points out that health and medical functions are widely scattered through many agencies in the federal government with resultant confusion and duplication of effort; that there are inadequacies in the distribution of medical, dental and public health services; that it is the policy of the federal government to aid the states through consultative services and grants-in-aid to extend medical, dental and public health serv-

ices; and that it is the policy of the United States to make provisions for voluntary deductions from the salary of federal employees of premiums directed by them to be paid to voluntary non-profit health insurance funds.

National Health Agency

The act would create in the executive branch of the government an independent agency to be known as the National Health Agency, which would be administered by a national health administrator, who would be appointed by the President with the consent of the Senate and who would receive a salary of $15,000 a year. To qualify for this position, the administrator must be a citizen of the United States and either a doctor of medicine with at least eight years of experience in the Public Health Service or a doctor of medicine with at least five years of active practice and three years of experience in a responsible position in medical research, teaching or administration.

It would be the function of the National Health Agency to provide advisory and consultative service; to make investigations of health problems and to collect and analyze statistics; to administer funds appropriated as grants to states; to prevent disease through sanitary methods; to promote maternal and prenatal child care; to promote purity, standard potency, and truthful and informative labeling of foods, drugs and cosmetics; and to train and rehabilitate disabled and handicapped persons.

Transfer of Children's Bureau and Bureau of Research and Statistics.—The bill would transfer to the National Health Agency the functions and duties of the Children's Bureau of the Department of Labor concerned with the administration of Title V of the Social Security Act as well as the functions and duties of the Division of Health Studies in the Bureau of Research and Statistics of the Social Security Board.

Division of the National Health Agency.—The National Health Agency would be composed of the following units:

1. The Office of the Administrator
2. The Public Health Service
3. The Food and Drug Administration
4. The Office of Vocational Rehabilitation
5. The Office of Health Statistics
6. The Office of Maternal and Child Health
7. And such other units as the administrator finds necessary.

The Surgeon General of the Public Health Service would continue to be appointed as the law now provides, but the heads of other units of the agency would be appointed by the administrator.

Advisory Council on Maternal and Child Care.—An Advisory Council on Maternal and Child Care would be appointed by the administrator to advise and consult with the Office of Maternal and Child Health. This council would be composed of eight members, at least three of whom must be doctors of medicine who are specialists in obstetrics or pediatrics.

Medical Research

The bill would authorize the appropriation of an amount not to exceed $2,000,000 each year for the next five years for research, demonstrations and training in the field of general medical health, to be used for grants-in-aid through the National Institute of Health, to universities and similar institutions, and an appropriation of $2,500,000 each year for the next five years for medical research in and operation of the National Institute of Health.

Medical Service for Low Income Groups

The bill would authorize the appropriation of $2,000,000 for the fiscal year ending June 30, 1947, and for each four succeeding years for the purpose of assisting the states to provide general health, hospital and medical services for families and individuals with low income. The funds would be allotted to the states under the following conditions:

1. The state plan must designate a single state agency as the sole agency for administration of the plan and must provide that after 1948 such agency shall be the state health agency.

2. The state plan must provide for the establishment of a state health advisory council consisting of representatives of non-government organizations or groups and of state agencies concerned with the administration or utilization of health, medical or hospital services, including representatives of state medical associations, voluntary non-profit medical associations or other groups interested in the improvement of health or medical services.

3. The state plan must contain satisfactory

evidence that the state agency will have authority to carry out the plan.

4. The state plan must set forth a state-wide program designed and calculated to provide within five years hospital services, surgical services and medical services in hospitals, clinics or similar institutions for all those families and individuals in the state having insufficient income to pay the whole cost of such services, and health inspection services for all children in elementary or secondary schools in the state.

5. The state plan must be based on a state-wide inventory of existing medical, surgical and hospital care to the end that such services be furnished without discrimination of race, creed or color, provided, however, that health services are limited to persons of low income.

Formula for Allotting Grants-in-Aid to the States.—The allotment to the states will be based on the population of each state and its percentage of tax-paying ability. The percentage of tax-paying ability would be that percentage which bears the same ratio to 50 per cent as the per capita income of the United States bears to the per capita income of each state, except that such percentage shall in no case be more than 66⅔ per cent or less than 25 per cent.

National Health Council.—In the adoption of administrative regulations, the Surgeon General would be instructed to consult with a National Health Council consisting of the Surgeon General, ex-officio, and eight members appointed by the administrator. Five of the eight appointed members must be persons who are outstanding in fields pertaining to health activities, and at least three of these five must be doctors of medicine. The other three appointive members must be familiar with the needs for medical care in urban and rural areas.

Limitation of Authority.—With the exception of responsibilities dealing with the approval of state plans and the allotment of funds to the states, no federal officer or employee would have the right to exercise any supervision or control over the administration, personnel, maintenance or operation of the state health services.

Dental Services for School Children and Low Income Groups

In order to assist the states to provide dental inspection and necessary dental care for school children and for individuals and families unable to pay the whole cost of such care, the bill would authorize the appropriation, for the fiscal year ending June 30, 1947, of the sum of $8,000,000; for the fiscal year ending June 30, 1948, the sum of $12,000,000; for the fiscal year ending June 30, 1949, the sum of $16,000,000; and for the fiscal years ending June 30, 1950 and 1951, the sum of $20,000,000 each.

In applying for federal funds to assist in operating a dental health program, a state would be expected to submit a plan which must include:

1. Designation of a single state agency for the administration of the plan.

2. Establishment of a state dental advisory council which would include representatives of non-governmental groups or organizations and state agencies concerned with the provision and administration of dental health services, including representatives of the state dental association, and other groups interested in the improvement of dental health and in better distribution of dental services.

3. Satisfactory evidence that the state agency will have authority to carry out such a plan.

4. Provisions for a state-wide program designed and calculated within five years to provide for annual inspection of the teeth of all children in elementary and secondary public and private schools in the state, and to provide for the care and treatment, including prophylaxis, fillings, roentgenography, extraction and related care, other than straightening of the teeth, of those children in elementary and secondary schools whose families or guardians have insufficient income to pay for the whole cost of such services. The selection of eligible children would be the responsibility of the principal or other head of the school at which the child is in attendance.

The state plan may also provide dental care for those families and individuals of the state having insufficient income to pay the cost of such service. In this case, however, provision must be made for the collection of proper charges of less than the total cost of services rendered to individuals and families unable to pay all of the cost but who are able to pay part of it.

State plans for the dental care program

would be based on a state-wide inventory of existing dental care and inspection and would provide that dental services be furnished without discrimination of race, creed or color.

5. Description of the financial participation of the state and governmental subdivisions. Such financial participation must be at least twice the amount provided by the federal government.

6. Provisions for the method of administration including the establishment and maintenance of personnel standards on a merit basis.

Approval of State Dental Plans.—The Surgeon General of the U. S. Public Health Service would be given the responsibility of approving state plans. In the event of dissatisfaction over the decisions of the Surgeon General, the state plan may be submitted to the National Dental Health Council. If the National Dental Health Council determines that the plan or modification complies with the provisions of the law, the Surgeon General must approve such a plan or modification.

The formula for allotting grants-in-aid to the states for carrying out dental health programs would be made on the same basis as was previously described for medical and hospital care.

If any state is dissatisfied with the Surgeon General's action with respect to approval of plans or allotments of grants-in-aid, such states may appeal to the U. S. Court of Appeals for the circuit in which the state is located.

National Dental Health Council.—In the adoption of administrative regulations, the Surgeon General would be instructed to consult with the National Dental Health Council consisting of the Surgeon General, ex-officio, the Assistant Surgeon General (Dental, ex-officio) and five members appointed by the administrator. The five appointed members shall be persons who are not otherwise in the employ of the federal government and who are outstanding in fields pertaining to dental health, at least three of whom shall be doctors of dental surgery.

Limitation of Authority.—With the exception of responsibilities dealing with the approval of state plans and the allotment of funds to the states, no federal officer or employee would have the right to exercise any supervision or control over the administration, personnel, maintenance or operation of state dental health services.

Research and Training

Dental Research.—The bill would create a National Institute of Dental Research.

The Surgeon General through the National Institute of Dental Research and in cooperation with the National Dental Health Council would be authorized to conduct, assist and foster research and investigations, experiments, demonstrations and studies relating to the cause, treatment, control and prevention of dental diseases; to promote the coordination of research conducted by the National Institute of Dental Research and similar research conducted by other public and private agencies, organizations and institutions and to make grants-in-aid to public and private agencies, organizations and institutions for conducting dental research; to provide fellowships in the National Institute of Dental Research and in other public and private institutions with such stipends and allowances as the Surgeon General may deem necessary for the purpose of obtaining the consultation and advice of persons who are experts in the field of dental diseases from the United States and abroad and of training persons to carry on research activities.

Duties of the National Dental Health Council.—The National Dental Health Council in cooperation with the Surgeon General would be authorized:

1. To review research projects relating to the study of the causes, treatment, control or prevention of dental diseases and certify approval to the Surgeon General for carrying out such research projects.

2. To review applications from universities, hospitals, dental clinics or other institutions, whether public or private, for grants-in-aid for research projects relating to dental health and to certify to the Surgeon General its approval of grants-in-aid in the case of such projects.

3. To recommend to the Surgeon General the acceptance of conditional gifts for study, investigation or research, or for the acquisition of grounds or for the erection of equipment or maintenance of premises, buildings or equipment of the National Institute of Dental Research. Donations of $50,000 or over to aid dental research would be acknowledged by the establishment of suitable memorials to the donors within the National Institute of Dental Research.

Appropriations for Dental Research.—The bill would authorize the appropriation of funds for grants-in-aid for dental research, training and scholarships within the National Institute of Dental Research: for the fiscal year ending June 30, 1947, a sum not to exceed $75,000 for grants-in-aid for dental research and training, and an amount not to exceed $175,000 for research and scholarships within the National Institute of Dental Research; for the fiscal year ending June 30, 1948, an amount not to exceed $150,000 for grants-in-aid for dental research and scholarships, and an amount not to exceed $250,000 for dental research and scholarships within the National Institute of Dental Research; and for subsequent fiscal years, an amount not to exceed $300,000 for grants-in-aid for research and scholarships, and an amount not to exceed $300,000 for dental research and scholarships within the National Institute of Dental Research.

Neuropsychiatric Research.—The bill would create a National Advisory Council on Mental Research and a National Institute of Neuropsychiatric Research within the National Institute of Health. The bill would also authorize the appropriation of funds to conduct research, investigations, experiments and studies relating to the diagnosis, treatment and prevention of neuropsychiatric diseases.

Construction of a Research Center.—The bill would authorize the appropriation of a sum not to exceed $1,000,000 for the erection and equipment of a suitable building for the use of the National Institute of Dental Research and a sum not to exceed $4,500,000 for the erection and equipment of suitable hospital, laboratory and related facilities for the use of the National Institute of Neuropsychiatric Research.

In passing judgment on this legislative proposal, the dental profession will undoubtedly weigh carefully its basic objectives, the possibilities which it offers for improvements in dental health for the public and whether or not it meets the general policies for dental health programs as approved by the House of Delegates of the American Dental Association.—*Allen O. Gruebbel, Executive Secretary.*

BUREAU OF PUBLIC RELATIONS

NEW RELEASE SUPPORTS LEGISLATIVE PROGRAM

A story cartoon explaining the long-term dental health legislative program of the American Dental Association has been distributed in mat form to 2,000 weekly and small daily newspapers throughout the nation by the Bureau of Public Relations.

The special release points out that nineteen out of twenty Americans suffer from dental diseases and that American children today have 244,000,000 dental cavities which should be filled. It describes briefly the two major legislative proposals (S.190 and S.1099) introduced in Congress by the American Dental Association and illustrates each of the three main points of the A.D.A. program: (1) research to discover causes of dental diseases and to find new means of prevention and control; (2) dental health education to motivate adults and their children to take better care of their teeth; and (3) community dental programs to provide every child with dental care regardless of income or geographic location.

It concludes with a statement that dental health is the responsibility of the individual, the family and the community, in that order, and declares that "dental health for children today means dental health for all tomorrow."

CASES AND COMMENTS

Repositioning of the Mandible by Occlusal Equilibration

Milton Tuerk, B.A., D.D.S., New York, and Robert I. Leavitt,* D.D.S.*

History.—A soldier, aged 26, had a prognathic occlusal relationship. The extreme protrusion of the mandible, aside from its esthetic disharmony, severely interfered with the patient's masticatory efficiency. The protrusive position, coupled with the locked bite, prevented any efficient eccentric mandibular excursions. All mastication was performed with a ginglymoid or hinge movement, and the patient complained of an inability to chew his food properly, and, consequently, of generalized digestive disturbances.

Examination.—The protruded or functional centric relationship (Fig. 1, left) was a strained position, the maintenance of which for any extended period of time was inconvenient. The patient was able to swallow and close the jaw, and retrude the mandible until the remaining upper incisors met the lower incisors (Fig. 1, right). This position we believed to be the true centric relationship, because it felt more comfortable to the patient and was a position capable of being maintained for a prolonged period of time without any discomfort. In this position, the bite was quite open, and the central and lateral incisors were the only teeth in occlusion. The patient usually maintained this position during the day, and only assumed the protruded position in order to gain even the slight masticatory function that this position could offer. The maintenance of this retruded relation when the patient was not eating had resulted in an excessive amount of trauma to the upper incisors, with a consequent gingival and alveolar recession.

Treatment.—In civilian life the patient had sought advice in an attempt to correct this condition. Consultation with dental specialists had limited his choice to either oral surgery or orthodontic treatment. Either method of treatment planning might have resulted in a better solution to the problem than ours, but in a combat zone the impracticability of either surgery or orthodontic treatment is evident.

The treatment planned was to obtain an occlusal equilibration of the anterior teeth in the retruded centric position by selective grinding. This would close the bite but not sufficiently to provide posterior occlusal contact. A removable acrylic bite-raising appliance for the lower jaw was to be made to supply the necessary posterior masticatory surface. The edge-to-edge bite of the anterior teeth would provide the patient with some degree of shearing or incisive mastication.

Impressions were taken and models poured

*Captain (DC) AUS.

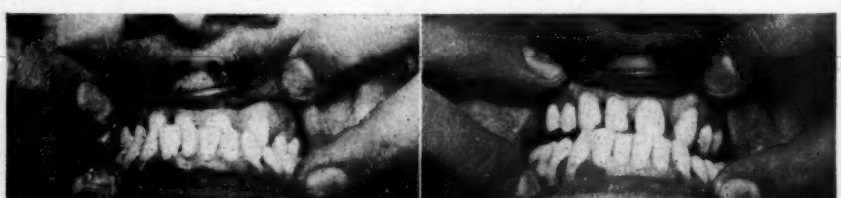


Fig. 1.—Left: Functional centric relationship. Right: True centric relationship (mandible retruded) before treatment.

in stone. The cases were studied in the functional (protruded) centric relation and were then mounted in the retruded (true) centric relation for study. By grinding on the model we were able to determine the amount of grinding that would be necessary to produce an edge-to-edge bite in which all of the anterior teeth would be in occlusal harmony. This grinding was not found to be excessive and was within the range of tolerance permissible on the natural teeth. The upper incisors were ground so that both the cuspids and the incisors were brought into occlusion. This closed the bite considerably as compared with the retruded position before grinding but still opened the bite slightly as compared with the protruded position. The natural teeth were not sensitive after the grinding.

After the anterior teeth were in occlusion, there was still a lack of posterior occlusion. We planned to provide contact of the posterior teeth with a gold-acrylic appliance. A four-clasp lingual bar skeleton was constructed. Impression compound was molded to the occlusal surface of those lower posterior teeth on either side which would be between the anterior and posterior clasps of the skeleton when it was inserted in the mouth. The upper surface of the compound was warmed, and the skeleton was inserted in the mouth. Starting with the mandible in its retruded position, eccentric mandibular excursions were performed. The edge-to-edge occlusion of the anterior teeth limited the degree of bite opening. These mandibular movements cut an occlusal pattern in the softened compound. The bite was maintained slightly more open than it was to be in the finished case (Fig. 2), to allow for finishing and milling.

The four clasps and the lingual bar aid in the retention of the appliance and in the transmission of lateral thrust. The acrylic onlay covers part of the buccal and lingual tooth surfaces and aids in the proper distribution of the masticatory force. With an appliance of this sort, individual teeth are not required to bear alone the excessive strain that added leverage induces when the bite is opened.

Comment.—This appliance, together with the occlusal equilibration of the anterior teeth, has resulted in an efficient and more

Fig. 2.—Completed appliance in the mouth. Note occlusion of upper posterior teeth with acrylic onlay.

esthetic occlusal relation. We realize that this is not the only method of treatment planning for this type of case, but, with the conditions limiting us, we feel that our treatment planning has resulted in a successful case without the incapacitation of a soldier.—*4704 White Plains Road.*

Dental Education in Denmark

The following report on dental education in Denmark was made by Lt. Cmdr. Charles R. Phinney of the Dental Corps of the U. S. Navy and was made available through the Dental Division, Bureau of Medicine and Surgery*:

During the month of January I was in the city of Copenhagen and while there I visited the Royal College of Dentistry, which is the only institution of its kind in Denmark.

The college is devoted to the study and teaching of clinical subjects in the major branches of dentistry. The courses in the allied medical fields, including anatomy, physiology, biochemistry and other subjects, are taught in the medical school with which the faculty of dentistry is in close contact.

The dental school exists as a distinct entity, in a separate building apart from the rest of the university. The school has been in its present location for about four or five years. In architectural design, the building follows modern lines. It is set in a small park,

*The opinions or conclusions contained in this report are those of the author. They are not to be construed as necessarily reflecting the views or the endorsement of the Navy Department. Reference may be made to this report in the same way as to published articles, noting author, title and source.

and is separated from a similar building by a large space which was originally intended to be the site of a large medical library. The construction of this library, as well as of another floor in the dental building, was brought to a halt by the advent of war, but will be completed in the postwar years.

The school building comprises three floors and a basement. The first floor includes a general reception hall, a large lecture hall, examination rooms, an operating room, a clinic for the teaching of x-ray practice and the administrative offices. The second floor is devoted almost entirely to clinic space, and there are about seventy-five operating units which are used for instruction in operative dentistry and periodontia. The third floor is somewhat a duplication of the second, but the facilities of this floor are used for prosthetic instruction and clinical practice. Here also are located the laboratories in which the students construct prostheses and do crown and bridge work.

There are about four hundred students in the school, about half of whom are women. The course is of four years' duration, and is preceded by a course of predental instruction shorter than that required in the United States. Therefore, the average age of the graduating students is somewhat lower than it is in our own schools. Formal instruction at the school is always followed by a two-year period of apprenticeship in the office of a practicing dentist, and at the end of this time the candidate is entitled to begin a private practice of his own.

When I was being shown through the school, my attention was directed to the equipment with which the clinics are furnished. The school, when it was opened, was equipped with operating units of special design which had been built for the clinics. The most interesting feature of these units is the grouping together of the engine, the cuspidor and the regulating panel, with a novel instrument cabinet. This combination takes the form of a cylindrical installation, which is not only pleasing to the eye but also extremely practical to use. The trays in the cabinet can be separately drawn out so that the student can make his selection of instruments most expeditiously. After their use, the instruments are taken to a centrally located sterilizing room where they are autoclaved by the assistants and then returned to the respective units from which they were removed. Each unit is also equipped with an ingenious device for the sterilization of instruments at the chair. Electrically heated buckshot maintains the temperature inside the container at an even 200° F. From my observation, this device was finding its greatest use at the units which were being used for root canal therapy, where the maintenance of continuous sterility was considered of importance to the technic employed. Also of interest was a method of sterilizing handpieces in a bath of heated lubricating oil.

In conversation with the instructors who were showing me through the school, I was able to ascertain that the standards of teaching, as well as the fields covered in the curriculum, compared very favorably with those in the universities in the United States. The courses of instruction were somewhat hampered during the last months of the German occupation of the country because of the activities, suspected or real, of some of the teaching staff in the underground movement. This movement was actively supported by many persons in professional ranks. With the establishment of more normal conditions, these difficulties have been overcome and the school is looking forward to maintaining the high professional and teaching standards which make it one of the foremost institutions of its kind in Europe.

The End of the War

To the Editor: Many people have asked me, since I have been liberated from a Japanese prison camp, how we knew the war was over when we were kept so completely uninformed at all times. This is a brief account of how an ostensibly medical letter clarified our suppositions and hopes.

At the termination of hostilities the Japanese attitude toward us did not change but the men were no longer required to go to their slave labors at the steel foundry. This made many of us suspect that something had occurred—possibly the end of the war. We had had indirect information that a British prisoner in another prison camp near by could speak and read Japanese. We thought that possibly the British prison

camp was better informed than we were. As camp doctor, I was finally permitted—after many appeals—to send a well-censored letter to the doctor at the British camp. My letter was couched in bad Latin but it was sufficient to deceive the suspicious Japanese. This is a copy:

TOYAMA PRISON CAMP NUMBER 7

August 20, 1945

Dear Dr. Reilly:

Before asking for another favor, I want to thank you for your past kindness and generosity in sparing the sulfadiazine. Despite your aid and all that we did for the man, we lost him.

A prisoner here has developed a suppurating lymphadenitis in the left and right axillae and the left mammae. The axillary lesions have cleared. The man has no medical history of infections; however, he was receiving luetic treatment until the outbreak of the war.

As you undoubtedly know, I am a dentist and therefore I do not feel qualified to diagnose his case beyond suspecting syphilis and bellum finitis. This latter condition has me puzzled. I would greatly appreciate your advice concerning his case and prognosis.

My limited Red Cross medical supplies have enabled me to give him only two ampules of Mapharsen.

Yours very truly,
Howard W. Friedman
Captain (DC)

Dr. Reilly's answer was brief but we were overjoyed, particularly at the possibility of being home in eight to fifteen days.

TOYAMA PRISON CAMP NUMBER 8

Dear Captain Friedman:

Many thanks for your note. I am sorry to hear of the death of your other patient.

From your description, this case may well have a luetic basis. The condition of bellum finitis is undoubted and quite definite and requires eight to fifteen ampules but unfortunately I have only one left.

Very sincerely yours,
W. Reilly
Captain (RAF)

Dr. Reilly was, however, a bit optimistic for it was almost a month before we were finally liberated.—*Howard W. Friedman, Major (DC) AUS, San Francisco.*

Supernumerary Deciduous Incisors

Richard Freedman, D.D.S.,
New York

The accompanying roentgenogram shows a pair of supernumerary deciduous incisors in a child aged 4½ years.—*155 West Seventy-First Street.*

BOOK REVIEWS

Juvenile Dentistry. By Walter C. McBride, D.D.S., associate professor of operative dentistry and director of the Department of Pedodontics, School of Dentistry, University of Detroit; visiting lecturer in children's dentistry, Postgraduate Division, School of Dentistry, University of Michigan. 359 pages. 298 illustrations. Fourth Edition. Price $6. Philadelphia: Lea & Febiger, 1945.

Twenty-one years of successful practice devoted to dentistry for children and dedicated to the advancement of that branch of dentistry make Dr. Walter C. McBride an outstanding man in his field. A thorough understanding of the many aspects of dentistry for children, plus a readable, delightful style, makes the fourth edition of "Juvenile Dentistry" a valuable investment for any dentist who includes children in his practice.

The author has made changes in the text of this edition to bring it up to date, and new illustrations have been added. The illustrations as a whole are good and well selected. The chapter on "Root Resection" by Dr. C. Taylor Hall, professor of oral surgery, School of Dentistry, University of Detroit; the chapter on "Physical Diagnosis" by Dr. H. V. Dwyer, lecturer on medical principles, School of Dentistry, University of Detroit, and the chapter on "Morphology of the Deciduous Teeth" by Dr. James Nuckolls, professor of operative dentistry, College of Dentistry, University of California, have been included without change.

The author states in the preface that there are four factors which have made dentistry for children unpopular with the average dentist: "(1) child behavior; (2) loss of fillings; (3) devitalization and abscesses following in the wake of restorations, and (4) unsatisfactory remunerations." There are few who will disagree with this conclusion. In the fifteen chapters which follow, the author has succeeded in presenting the various phases of dentistry for children so as to make them attractive, simple and practical for the general practitioner of dentistry.

The chapters on "The Management of the Child" and "The Management of the Office" are especially outstanding. There is no doubt that "when a man in a general practice of dentistry refuses to work for children or fails to render them satisfactory service, he literally throws over his shoulder one of the finest factors in practice-building and practice-maintaining he could possibly hope to utilize" (p. 51). There is a real danger that, unless the private practitioners of dentistry begin to practice more and better dentistry for children, some other health agency will assume the responsibility for them. It is difficult to understand why dentists have not become aware of this danger—and this opportunity—earlier.

Most of the described operative technics are those which the author uses in his practice. As he states, "The procedures have been developed to meet actual situations and demands and they have met with an average degree of success in their use." The inclusion of other procedures which have been proved and accepted would increase the value of the book for dental practitioners.

A broader discussion of nutrition and its role in dentistry, the listing of references at the end of each chapter instead of scattering them throughout the book and a more extensive bibliography would, I think, add greatly to the value of the book as a reference for students.

The dental practitioner who is desirous of improving his knowledge of dentistry for children will find "Juvenile Dentistry" a valuable addition to his library.—*Ralph L. Ireland.*

An Introduction to Physical Anthropology. By M. F. Ashley-Montagu. 325 pages. Illustrated. Price $4.00. Springfield, Ill.: Charles C. Thomas, 1945.

This introductory book on physical anthropology gives the reader an excellent grasp of the physical background of man without presenting long lists of data on measurements and statistics on bones and their descriptions. It presents physical anthropology as a very living subject of man in his present physical state and his relationships and evolution in the light of genetics and environment.

Ashley-Montagu approaches the subject with a consideration of the primates as a zoological group. The order of primates embraces the lemurs, tarsiers, monkeys, apes and man. The groups are described and compared with the purpose of acquainting the reader with the significant differences rather than with details of description. It is interesting to note in this connection that the Old World monkeys have only two bicuspids whereas the New World monkeys have three.

Next the author takes up the origin and evolution of the primates, supplementing his descriptions of the early forms with a geological time scale of the appearance of various representative forms of life. The estimation of the number of millions of years in each time period, with the exception of the entry under the recent epoch of time, were obtained by the uranium transformation method.

This exposition is followed by an even more interesting one on the origin and evolution of man. Meganthropus, Giganthropus blacki, Pithecanthropus erectus, Sinanthropus pekinensis and many other fossil evidences of man's predecessors are taken up briefly. In a discussion of the newer concepts of man's evolution, Ashley-Montagu states that "in earlier days when but a few fossil remains were available, the extreme differences between such a form as Pithecanthropus and another such as Neanderthal or Piltdown man, led students to think of these types as generically very distinct." Their dissimilarity has grown less with the discovery of intermediate forms. For example, Weidenreich holds that Pithecanthropus does not differ from Sinanthropus any more than does an Australian aboriginal from an Arab. An example of this similarity is shown in the incidence of taurodontism, a condition in which the pulp cavities of molars are very large. Once thought to be a unique specialization of Neanderthal man (thereby excluding him from the ancestry of man), the condition is now known to occur typically in orangoutang and chimpanzee, frequently in Eskimo and Bushman and occasionally even among Whites. The presence of taurodontism in Whites may refer back to persisting strains of Neanderthaloid ancestry or forward toward the appearance of similar variation in modern man.

The chapters on "Ethnic Group Differentiation" and "The Divisions and Ethnic Groups of Man" reject the older nongenetic terms "stock" and "race" and replace them with "division" and "ethnic group," respectively. The author defines "division" as a collection or complex of isolates characterized by a relative uniformity of physical characters which in combination serve to distinguish that division from all others (Negroid, Caucasoid, Mongoloid). An ethnic group he defines as "a subdivision of a division of mankind, an isolate, more or less distinguished from other isolates within the same division by the possession of one or more morphological or measurable characters."

A subsequent chapter deals with the social aspects of the divisions and subdivisions, and examples are cited to prove that physical and cultural variability are limited and reduced by isolation, while the opposite effect follows the removal of isolating barriers.

An interesting final chapter on heredity and environment covers a number of subjects with which dentists should be more conversant. Included are twin studies, constitutional typing such as Sheldon's somatotyping (which is discussed somewhat too briefly), sex differences and linkage, climatic effects on individuals, socio-economic factors and growth. Ashley-Montagu believes that "strictly speaking, heredity must be regarded as the blending of two inheritances, the one biological, and the other social."

An appendix on a "Practical Synopsis of Methods of Measurement in Physical Anthropology" is also included in the book. A helpful guide to the reader are the author's comments on all of the references given in the volume. Important and interesting material is found throughout the book, but of special interest to the dentist are the first three chapters dealing with the physical background and evolution of man with frequent references to teeth.—*Albert A. Dahlberg.*

Cleft Palate and Speech. By Muriel E. Morley, B.Sc., F.C.S.T. 156 pages. Illustrated. Baltimore: Williams and Wilkins Company, 1945.

To the oral or plastic surgeon dealing with the unfortunate victims of these congenital defects and acquired perforations, this manual will be of great interest. For the speech therapist it might well serve as a bible.

The author begins the treatise with a discussion of the prenatal processes leading to

cleft of the palate, and then describes tersely and to the point the various operations which have been used to accomplish a correction. Although description by one who does not do the surgical operations might seem out of order, the discussion of surgical procedures is so pertinently related to the rest of the text that its inclusion is logical. The obvious favoritism of the author for the pharyngoplasty and four-flap operation of Wardill, with provision for mucosal coverage of the nasal surface, is well explained by the improved speech results.

Specific criteria of success in achieving normal speech are laid down. The undesired nasal escape of air is avoided by (1) proper surgery, (2) exercises to teach the patient how to use the soft palate to avoid leakage, (3) actual speech practice under group supervision and (4) construction of an occluding dental plate in cases in which a hard palate defect cannot be closed by surgery. The author gives no experiences relating to soft palate prostheses such as a velum obturator.

Three groups are used for classification of patients with cleft palate speech defect: Group I, cases with gross nasal escape of air resulting in weak consonants and nasalized vowels; Group II, cases with articulatory substitutions such as the glottal stop, pharyngeal *s*, or the replacement of one sound for another, for example, *t* for *k;* Group III, cases whose speech consists of vowel sounds and nasal resonants only. Their speech, of course, is unintelligible.

The author then sets forth the methods by which, through exercise, training and practice, preferably in groups, normal speech can be achieved. Case reports are included to illustrate particular points, and failures are very fairly recorded, with an appended explanation in each instance.—*Henry B. Clark, Jr.*

Prepayment Medical Care Organizations. By Margaret C. Klem, Social Security Board, Bureau of Research and Statistics. Third Edition. 148 pages. Price 25 cents. Washington, D. C.: U. S. Government Printing Office, 1945.

The growth of prepayment medical care plans during the past thirty-five years provides ample proof of the trend in organized methods of payment for health care. The movement in the United States originated in 1911 in some of the hazardous industries on the West Coast. Today, 235 are in operation in all sections of the country. There is no longer a question about whether some type of health care will be financed under a prepayment system; there is considerable difference of opinion, however, about the amount of service which can and should be provided under group plans and, more particularly, about who should manage the plans. This difference of opinion is the fundamental issue in debates on the Wagner-Murray-Dingell bill.

The book presents a tabulation of eligibility, coverage, personnel and types of services provided in 235 prepayment medical care plans under the sponsorship of industries, medical societies, private group clinics, consumer groups and government. It is interesting to note that only a few organizations provide comprehensive dental service. Furthermore, of the 6 million persons participating in prepayment plans, only 20 per cent are eligible for diagnostic x-ray service, 13 per cent for extractions, 5 per cent for prophylaxis and 5 per cent for fillings.

Those who are interested in detailed data on the provision of health services under a prepayment system will find this book valuable as reference material.—*Allen O. Gruebbel.*

A Review of the Structure and Function of the Human Body. By Ralph N. Baillif, Ph.D., and Donald L. Kimmel, Ph.D. 328 pages, with 164 illustrations. Price $3.00. Philadelphia: J. B. Lippincott Company, 1945.

There are many good books on the structure of the body (anatomy) and also many more good ones on the functions of the body (physiology), but there are only occasional attempts to combine these two closely related sciences into the logical and coherent union that they deserve. All too many textbooks and far too many teachers present one of these two subjects as though the other did not exist. From the student's point of view, most courses in anatomy consist of the memorization of the origin, insertion and innervation of the muscles, while the nerves of the body might as well be so many pieces of string. The physiology courses turn out to be discourses on kymographic tracings or other records and careful descriptions of surgical

procedures, with little attention to the whys and wherefores of the close correlation between the structure and the function of an organ. When students realize this important correlation, it becomes clear to them that, for a given function, the organ or even the cells which make up the tissues composing this organ must have certain definite properties in order to work efficiently.

It may be argued that this teleologic approach to the teaching of physiologic anatomy is simply begging the question, but it cannot be denied that for the beginning student such obvious relationships need to be pointed out, especially if the subjects are to be understood as well as learned.

The book is divided into four units. The first is an introductory one which considers the physiologic building units (cells, tissues and organs), correlating their structure with their function. This unit is expected to acquaint the student with his working materials and to orient him in forming a scientific concept of the body and its parts. The other units are entitled: "Skeletal, Muscular and Circulatory Systems," "Digestive and Respiratory Systems" and "Urogenital, Endocrine and Nervous Systems." The illustrations, in general, are excellent.

A book of this type might easily go to one of two extremes. On the one hand, the material might be very concentrated with little detail about any one of the multitude of subjects. At the other extreme, there might be many details about a few carefully selected subjects. This book is a happy mixture of the two extremes. The choice of what should be included and what should be deleted must have been a difficult one, but it appears that the authors have used rare judgment in their selections.

At times, however, the material seems too concentrated or too sketchy for student use, but it must be remembered that the book is designed to accompany a series of lectures. There are, of course, several points at which various authors would differ in their method of presentation and, sadly enough, there are some glaring errors in fundamental definitions. For example, it is difficult to understand why the authors chose to say that the *processes* of filtration, diffusion and osmosis are *forces*. It is likewise unfortunate that only the palpatory method for determining blood pressure is illustrated, while the auscultatory method is described in detail. Considering the value of the book in general, these lapses can be pardoned.

This book is highly recommended as a study guide for beginning students and more so as a review and refresher outline for those who already claim a nodding acquaintance with the structure and function of the human body.—*Gustav William Rapp.*

Pattee's Dietetics. By Alida Frances Pattee; revised by Hazel E. Munsell, Ph.D., investigator in the Nutrition Laboratory of the Pentagon Post Restaurant in Washington and formerly of the Bureau of Home Economics of the U. S. Department of Agriculture. Ed. 23, revised. 700 pages. Illustrated. Price $3.50. New York: G. P. Putnam's Sons, 1945.

"Pattee's Dietetics" was first published in 1902 and has been revised many times since then. The fact that more than 400,000 copies have been sold amply demonstrates the usefulness of this book.

The dentist who is interested in the application of dietary information in his practice will find "Pattee's Dietetics" useful. While there is no specific information with respect to diet and dental health, the fundamental information, as well as the wealth of detail with respect to the use of foods and their values to the body health, could be adapted for use in the dental field.—*Grant Van Huysen.*

Die Specielle Pathologie und die Verletzungen der Mundgebilde (Special Pathology and Injuries of the Oral Organs). By A. Fonio, professor of surgery, University of Bern, Switzerland. Bern: Medizinischer Verlag Hans Huber, 1945.

The author, in the preface, states that the book is not meant to be a textbook but a compendium or an outline of the author's lectures. The list of the subject matter is rather complete, but the chapters are short and often sketchy. The few illustrations are diagrammatic. The book does not have a place in the curriculum of American dental schools and is also not informative enough to be of use to the practitioner, even if the difficulties of the language are overlooked.—*B. Orban.*

The Technique of Stainless Steel Work in Mechanical Dentistry. By G. H. Siddle. Ed. 2, revised. 84 pages, with 33 illustrations. Price 5 shillings. London: Henry Kimpton, 1945.

The author gives valuable space to needless pleading for the use of stainless steel in dentistry. The metal is now generally accepted and needs no special briefs. It is doubtful if one dentist or even a small group of dentists would have a sufficient volume of work to warrant their purchasing the elaborate equipment needed for steel work in general. The uses of the hydraulic press and the spot-welding machine are described in some detail, and the method of constructing a spot-welding machine is presented. The pouring of dies and counter dies for swaging dentures is given detailed description. It is doubtful again whether the private dentist can afford to take the time and the trouble to construct dies and counter dies. Furthermore, denture swaging entails knowledge of, and ability to follow, an extremely exacting technic.

In the United States, the construction of laminated, swaged and soldered full and partial steel dentures has been replaced largely by casting. The requirements of casting steel have as yet not been brought within the limitations of the private dental office laboratory, and this book adds nothing of value to the technic of casting. Description of methods of waxing for casting, details in the construction of stone master casts, and fluxing and soldering, especially of steel orthodontic materials, will have to wait future publication, since they are not covered in the present volume.—*J. A. Salzmann.*

Glycerin: Its Industrial and Commercial Applications. By Georgia Leffingwell, Ph.D., editor, Glycerine Facts and Soap Uses in Modern Industry, and Milton Lesser, B.S., technical editor, Drug and Cosmetic Industry; consultant, Association of American Soap and Glycerine Producers, Inc. 250 pages. Price $5. New York: Chemical Publishing Co., Inc., 1945.

The authors of this interesting book devote twenty-seven chapters to a discussion of as many broad fields in which glycerin is useful. The chapters on "Beverages," "Foods," "Medicine and Surgery," "Orthodontia and Dentistry," "Pharmaceuticals" and "Glycerin Derivatives," all of which are of potential interest to dentists, comprise about fifty-five pages, or nearly one-fourth of the book. Many dentists will be interested in the chapters on "Cleaners and Polishers," "Photography" and "Metals." The book is replete with formulas of which glycerin is an ingredient. Bibliographies which include references to patents and to scientific and industrial publications follow most of the chapters.

The versatile character of glycerin is properly stressed. However, if one is to judge by the formulas in the chapter on "Orthodontia and Dentistry," many of the therapeutic preparations described in the book are outmoded. The use of mixtures containing potassium chlorate, ipecac, tannin and the arsenicals is not supported by adequate scientific evidence; yet many such mixtures are described uncritically in the book.

Hanke's solution[1] of sodium parahydroxy mercuribenzoate, which has not been shown to be useful in dentistry, is also described uncritically.

It appears, therefore, that the authors have erred, at least in their chapter on dental uses, in listing indiscriminately many possible uses for glycerin, without providing the reader with an evaluation of the formulas and uses cited.

References to reports of the Council on Dental Therapeutics or to Accepted Dental Remedies[2] are not to be found in the chapter on "Orthodontia and Dentistry." The bibliography for the chapter on "Medicine and Surgery" contains no reference to New and Nonofficial Remedies and only one reference to the *Journal of the American Medical Association.* While it is recognized that much information on medical and dental uses of glycerin has appeared in other media, almost complete omission of the four authoritative sources of information cited above indicates lack of thorough and balanced reporting of the available information on the part of the authors.

Despite its uncritical character, the book is interesting and informative. Much of it may be read carefully with profit by dentists. —*Donald A. Wallace.*

1. Solution 58 (Hanke)—Not Acceptable for A. D. R. J.A.D.A. 28:1880, November 1941.

2. Accepted Dental Remedies, Ed. 11. Chicago: American Dental Association, 1945.

CURRENT LITERATURE

Temporary Protection of Prepared Bridge Abutments. Abraham I. Sheppard. J. 2nd. Dist. D. Soc. (N. Y.) 32:157, April 1946.

The protection of prepared bridge abutment teeth between the various stages in the construction of a fixed bridge is described. Soft annealed aluminum shell crowns are used for posterior teeth. Celluloid forms with a suitable shade of synthetic porcelain for the labial surface and zinc oxide-eugenol cement or gutta-percha for the lingual portions are employed for anterior teeth. In posterior teeth the protecting medium is zinc oxide-eugenol paste or gutta-percha with zinc oxide-eugenol cement for hard bite and bite-raising cases. Properly prepared forms may be used repeatedly and over periods of several months to keep the prepared teeth clean and sterile, to avoid pain by protecting prepared abutments from mouth fluids and preventing irritation of the dentin and pulp, to prevent extrusion of the antagonist teeth or movement of the prepared teeth in the socket, to prevent fracture of their margins and in general to maintain occlusal space and relation.

Submaxillary Adenitis, Embedded Teeth and Deviation Deformity of the Mandible. Eugene V. Linsey. J. Oral Surg. 4:16, January 1946.

A case is described of a 28-year-old woman who presented herself with a complaint of a painless recurrent swelling in the lower right submaxillary region of five to six years' duration. Examination revealed an asymmetry in facial contour in the right mandibular area with apparent right deviation of the mandible. Roentgenographic studies showed erosion of the inferior border of the right mandible below the molar region. The inferior border sloped upward and backward toward the condylar process at an oblique angle. The submaxillary swelling was firm, nontender and nonpainful. The area was not adherent to the mandible but appeared to be "slung" below the mandible. The cervical lymph glands were not involved. The patient was wearing an acrylic full upper denture with the six anterior teeth present in the lower arch. The lower left third molar and the lower right second and third molars were found impacted. Extraction of the two impacted molars on the right side, with construction of an acrylic splint in anticipation of a possible fracture of the mandible, was undertaken. The postoperative course was uneventful and was accompanied by disappearance of the submaxillary lymphadenitis.—*R. Likins.*

The Relationship of Dental Malocclusion to Vacuum-Otitis Media and the Use of Dental Splints During Descent from Altitudes. H. R. Bierman and I. S. Brickman. Ann. Otol., Rhin. and Laryng. 55:5, March 1946.

The otoscopic findings after recompression from high altitude in a group of 439 aviation cadets and student officers were correlated with the state of dental occlusion. Positive otoscopic findings were exhibited by 12 per cent of those with normal occlusion and by 30 per cent of those who showed some degree of malocclusion. Ear block on descent occurs about three to five times more frequently in persons with malocclusion than in those with normal occlusion. The use of acrylic dental splints during descent materially aided ventilation of the middle ear in subjects with malocclusion, thereby effectively reducing the incidence of ear block.—*R. Likins.*

Pontic Construction and Assemblage. David H. Coelho. J. 2nd Dist. D. Soc. (N. Y.) 32:162, April 1946.

The technic used in pontic construction is best explained by detailing the steps followed using a long-pin facing. Baked porcelain ridge laps are used. Protective bevels are placed on all facings, both upper and lower. The long-pin facing is an all-purpose facing usable under almost any conditions in any part of the mouth. Many other facings are available but the disadvantages outweigh the advantages of most of them.

Immediate replacements are made in a similar manner. The cast is prepared with a socket-like depression after the natural tooth has been removed. Backing construction rounds out the contour of the pontic, keeping a narrow buccolingual width. Interproximal spaces are progressively opened wider the more posterior the pontic. Assemblage by the "direct method" is the best means for obtaining proper tissue contact and esthetics. Correct assemblage and proper pontic construction, observing biologic and mechanical factors, contribute greatly to the success of a fixed prosthesis.

Treatment of Subacute Bacterial Endocarditis with Penicillin: Second Report. M. H. Dawson and T. H. Hunter. Ann. Int. Med. 24:170, February 1946.

Thirty-five cases of subacute bacterial endocarditis have been treated with penicillin. The group includes fifteen new cases and a follow-up study on seventeen of the twenty patients previously reported.

Of thirty-five patients, thirty are alive and apparently cured of the infection. The average follow-up period has been fourteen months.

Some patients have required large doses of penicillin, in one case 92,000,000 units in repeated courses.

The role of heparin as an adjutant to therapy is discussed and the opinion is expressed that in most cases its use is inadvisable.

The importance of large daily doses for periods of two to three weeks is stressed. With persistent therapy, a cure should be possible in the majority of cases in which the infecting organism is penicillin-sensitive.—*Paul H. Keyes.*

Aids in Diagnosing Dental Pulp Diseases. Harold G. Green. U. S. Nav. M. Bul. 46:262, 1946.

The use of cone-shaped pieces of ice, applied with the apex of the cone on the external tooth surface, for the detection of diseases of the dental pulp is advocated. The advantages of using ice rather than common methods are that the use of ice requires no special tooth preparation, the ice has a constant temperature on the melting surface and it is possible to test the pulps of teeth containing large restorations or crowns.

Pulp hyperemia is said to be characterized by marked sensitiveness to ice, of short duration. Early pulpitis also causes the tooth to be more sensitive than normal, the pain produced being prolonged. Ice will afford relief from pain when the pulp is putrescent, while in chronic ulcerative pulpitis there is little or no reaction to stimulation. A totally gangrenous pulp will give no response.—*S. W. Leung.*

The Treatment of Agranulocytosis with Penicillin. E. W. Boland, N. E. Headley and P. S. Hench. J.A.M.A. 130:536, March 2, 1946.

Since 1941, sulfonamides and penicillin have been used in the treatment of granulocytopenia or agranulocytosis. At first they were used more often despite the presence of agranulocytosis rather than specifically for it. Seven cases of that disease successfully treated with sulfonamides have been reported. But because sulfonamides may themselves produce agranulocytosis, penicillin would seem to be the remedy of choice.

Ten cases of agranulocytosis have now been treated with penicillin; prompt recovery has occurred in every case. This represents a notable improvement in the treatment of the condition and allows for much greater optimism in prognosis than has heretofore been possible. In some of these ten cases, leukopoietic agents were used in conjunction with penicillin, but the current trend is to rely on penicillin alone. Experiences to date indicate that penicillin constitutes the most potent remedy at hand for the prevention or control of the serious, potentially fatal complication of agranulocytosis.—*E. Costich.*

Effect of Growth and Development on Abnormal Labial Frenum. A. B. Schwarts and T. R. Abbott. Am. J. Dis. Child. 71:248, March 1946.

A number of young children showing abnormally large and thickened labial frenum were examined periodically for eleven and one-half years. At the last examination there was no sign of abnormality, a recession of the frenum attachment and an approximation of the central incisors having taken place without any intervening remedial measures. The authors state that they have seen no example of thickened labial frenum which growth and development did not remedy.—*J. E. Gilda.*

Bacillin, A New Antibiotic Substance from a Soil Isolate of Bacillus Subtilis. J. W. Foster and H. B. Woodruff. J. Bact. 51:363, March 1946.

A new antibiotic, bacillin, has been obtained from a soil isolate of B. subtilis and is highly active against gram-negative and gram-positive bacteria in certain media. Its differentiation from known antibiotics, its production in solid and liquid media, the purification procedure and some chemical properties are described. Crude bacillin concentrates are moderately toxic for mice and completely ineffective in protecting the animals from virulent bacterial infections. Blood constituents and other complex natural materials reduce or abolish the antibacterial properties of bacillin.—*Paul H. Keyes.*

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Titles marked with an asterisk are reviewed below.

Masticatory Habits. An Analysis of the Number of Chews When Consuming Food. Bertil Dahlbert, University of Uppsala, Sweden.—67.

The Editor's Viewpoint.—73.

*Studies in Periodontal Disease. II. Putrefactive Organisms in the Mouth. M. Berg and L. S. Fosdick, Northwestern University.—75.

*Whole Saliva as a Source of Certain Growth Factors for an Oral Strain of Lactobacillus Acidophilus. David Weisberger, Harvard University.—85.

Sterilization Effectiveness of a Hot Oil Bath. Gerald L. Parke, Naval Dental School.—91.

Introduction of Sodium Iodide into the Calcified Dental Tissues. Irwin Mandel and Lester Samuel Sarkady, Columbia University.—97.

*Variability of the Pain Threshold in Man. J. R. Schamp and H. M. Schamp, College of Physicians and Surgeons, San Francisco.—103.

Whole Saliva as a Source of Certain Growth Factors for an Oral Strain of Lactobacillus Acidophilus. David Weisberger.

Since the nutritional requirements for a representative species of bacteria present in the oral cavity have been established, it seemed advisable to study the availability of these nutriments in the environment of this organism. The organism was chosen not specifically for its acidogenic properties but primarily because of its characterizations and its adaptability to the study of biologic changes occurring in the oral cavity. For this study whole saliva was used as a source of essential nutriments which were replaced by the saliva in a synthetic medium. It was found that whole saliva supplied small amounts of the essential water soluble vitamins and required mineral salt fraction, but, even after concentration, did not furnish essential nitrogenous substances for maximal acid production.

Studies in Periodontal Disease. II. Putrefactive Organisms in the Mouth. M. Berg and L. S. Fosdick.

The rate of putrefaction of salivary proteins under the influence of seventeen organisms isolated from the mouth and under varying conditions was studied. It was found that practically all of the organisms studied may play some role in the putrefaction of salivary proteins. It was also found that under the conditions of the experiment no single type of organism is capable of producing putrefaction as rapidly as the mixtures that are normally present in the mouth.

Variability of the Pain Threshold in Man. J. R. Schamp and H. M. Schamp.

Using the technic of Hardy, Wolff and Goddell, the authors found a significant variability in the pain threshold determinations in different persons and also in the same person over a period of time. The average threshold of sixteen young adults was 67.7 millivolts with a standard deviation of 23.5 millivolts. About two-thirds of the persons showed a gradual rise in threshold over a period of months.

The Preparation and Properties of an Amylase Inhibitor of Wheat. The Mode of Action of an Amylase Inhibitor from Wheat. S. Militzer, C. Ikeda and E. Kneen. Arch. Biochem. 9:309, 321, April 1946.

Amylase inhibitor from wheat was purified by absorption and elution from aluminum hydroxide. A 750-fold concentration was

thereby effected. The inhibitor was precipitated from solution by protein precipitants, did not dialyze through a viscose membrane and was inactivated by nitrous acid and by digestion with ficin. Therefore, the inhibitor is thought to be a protein. At alkaline pH levels, the inhibitor was readily denatured at 95° C. in ten to fifteen minutes. At acid pH levels, it was much more stable and required more than sixty minutes. The inactivation of the inhibitor by a number of standard oxidizing and reducing agents was studied.

The effectiveness of the amylase inhibitor increased upon standing in solution. The reaction between amylase, starch and the inhibitor is a non-competitive inhibition. Evidence points to tryptophane of the inhibitor protein as being the sensitive amino acid grouping in the molecule, since reagents known to be specific for this amino acid caused the inhibitor to lose its activity.—*J. E. Gilda.*

Dental Treatment for the Prevention of Aero-Otitis Media. W. J. Kelly and H. W. Langheinz. Ann Otol., Rhin. and Laryng. 55:13, March 1946.

Dental measures are described which proved successful in preventing recurrence of aero-otitis media in forty-six of fifty candidates for submarine service whose ears blocked previously when submitted to pressure changes. An attempt was made to restore an occlusal plane, fully equilibrated, that permitted unhampered movement of the mandible in the various excursions and to provide adequate support in all balancing and working positions. After treatment, the men were again submitted to 50 pounds pressure and examined otoscopically upon emerging from the chamber. Forty-six of the fifty cases exhibited absolutely no reaction. The procedures used and a discussion of the possible reasons for success are presented.—*R. Likins.*

Effect of Synthetic Lactobacillus Casei Factor in Treatment of Sprue. W. J. Darby, E. Jones and H. C. Johnson. J.A.M.A. 130:780, March 23, 1946.

The fundamental defect in sprue appears to be impaired absorption of various substances from the gastro-intestinal tract, whereby a deficiency of certain factors may be brought about. Criteria generally accepted for the diagnosis are glossitis, diarrhea with increased fat in the stools, weight loss, pigmentation of the skin, macrocytic anemia, moderate leukopenia, impairment of absorption of oral glucose and vitamin A and a characteristic gastro-intestinal pattern on x-ray examination. Complete findings are presented in three cases of sprue treated with L. casei factor (vitamin M, folic acid). The blood picture, glossitis, diarrhea and absorption of water soluble factors responded to intramuscular administration of the vitamin in doses of 15 mg. daily.—*J. E. Gilda.*

Mixed Salivary Tumor in the Right Tonsil Fossa with Narcolepsy and Cataplexy. C. E. H. Bates. Ann. Otol., Rhin. and Laryng. 54:812, December 1945.

A 30-year-old man complained of a desire to sleep at all times. There was difficulty in breathing while sleeping. On three occasions the patient had fallen down while laughing. A large tumor mass was present in the right tonsillar fossa, extending well up into the supratonsillar fossa. At operation an encapsulated tumor was found filling the entire fossa and definitely pushing the carotid sheath and contents well outward. Histologic evidence proved it to be a mixed tumor of a salivary or mucous gland. After the operation there was a complete remission of symptoms.—*J. E. Gilda.*

Neuroma of Palate: Report of a Case. George W. Christiansen and James L. Bradley. J. Oral Surg. 4:24, January 1946.

A case is described of a 55-year-old man who had suffered for fifteen years from recurrent attacks of severe paroxysmal pain in the right side of the face upward over the scalp and posteriorly to the parietal region. A regular precursor of impending pain was an itching sensation on the labial surface of the lip in the maxillary cuspid region and in the adjacent teeth and alveolar bone. Slight edema of the right side of the naris was present with edema around the right eye which temporarily interfered with vision. Examination revealed an edematous-like red enlargement of the right side of the palate over the posterior palatine canal, which extended to the midline and anteriorly to the maxillary first bicuspid region. This was tender to pressure and increased in size during an acuity test. The growth was removed surgically and

the postoperative course was uneventful. Remission of previous symptoms followed. Pathologic examination suggested a benign neuroma.—*R. Likins.*

Hairy or Black Tongue. M. N. Kleinert. Ann. Otol., Rhin. and Laryng. 55:188, March 1946.

A case is described of a 36-year-old man who was hospitalized for treatment of a condition known as hairy black tongue. Intramuscular penicillin supplemented with sulfadiazine, perborate gargles, penicillin troches and sulfanilimide throat tablets proved ineffectual. Daily cleaning of the affected areas by curettage and applications of various antiseptics were of no avail. Four months after institution of a higher vitamin diet augmented with commercial preparations of cevitamic acid, vitamin D and vitamin B complex, there was no appreciable improvement.—*R. Likins.*

Effect of Facial Paralysis on the Growth of the Skull of Rat and Rabbit. S. L. Washburn. Anat. Rec. 94:163, February 1946.

The effects of paralysis of the facial muscles were studied in twenty-six rats and five rabbits. The cranial asymmetries which follow unilateral section of the seventh nerve are caused by the pull of the functioning facial muscles on the normal side and by the tension exerted by the atrophied cheek on the operated side. In the rat there is little atrophy and the maxillary and nasal bones deviate to the normal side. In the rabbit atrophy of the cheek is pronounced, causing the maxillary and nasal portion of the skull to tend to the operated side. Normal growth depends on normal functions of the facial muscles.—*Paul H. Keyes.*

Oral Penicillin in the Treatment of Oral Lesions. R. H. Brodsky and L. Herschfus. Quar. Bul. Sea View Hosp. 8:55, January 1946.

Thirteen cases of periodontoclasia, five cases of Vincent's infection and ten cases of miscellaneous infections resulting from tooth involvements and maxillary sinusitis were treated with oral penicillin tablets (350,000 units daily) for a period of three days. For some conditions this course of treatment was repeated several times. Eleven of the thirteen cases of periodontoclasia manifested definite evidence of improvement notwithstanding the absence of scaling, curettage and massage. The five cases of Vincent's infection responded promptly to this therapy. The ten miscellaneous cases, including chronic maxillary sinusitis, alveolar abscess, periapical sinusitis, cellulitis, granuloma, periapical edema and postnasal drip, displayed moderate to marked improvement. Evidence for improvement in cases of periodontoclasia was based on gingival changes. Roentgenographic support is not presented.—*R. Likins.*

Survey of the Blood Plasma Levels of Vitamin A, Carotene, Ascorbic Acid, and Tocopherols of Persons in an Area of Endemic Malnutrition. P. L. Harris *et al.* Am. J. Pub. Health 36:155, February 1946.

A survey was made of the distribution of vitamin A, carotene, ascorbic acid and tocopherol concentrations in the blood of 350 patients in the nutrition clinic and seventy "normal" persons working in the same area. The "normal" persons had no symptoms, whereas all "clinic" patients had symptoms but no diagnostic lesions.

The mean levels of vitamin A, carotene, ascorbic acid and tocopherol in the plasma of the patient groups were significantly lower (72, 70, 51 and 75 per cent, respectively) than those of the normal persons. These findings suggest that it would be worth while to administer vitamins A, C and E, separately and under controlled conditions, to determine the effect on the blood levels and whether or not there is an improvement in any of the symptoms. Such a test is now under way.—*Paul H. Keyes.*

Trends and Problems in Fixed Crown and Bridge Prosthesis. Earle Banks Hoyt. J. 2nd. Dist. D. Soc. (N. Y.) 32:177, April 1946.

A brief outline is given of the author's concept of the developing philosophy of oral reconstruction through the agency of fixed appliances. Attention is drawn to the need of recognizing such appliances as a form of mechanical therapy capable of providing an immunizing factor.

LIST OF NAVY DENTAL OFFICERS SEPARATED FROM SERVICE

The following naval dental officers have been separated from service, according to lists received from the Navy Department. These lists are not complete. Other names will be published as soon as possible.

Alabama

Birmingham	Farnum, Leon V., Jr.	Lieut.
Brewton	Dozier, Cleatus A.	Lieut.
Double Springs	Briscoe, Doyce G.	Lieut.
Prattville	Jones, Robert M.	Lieut.

California

Auburn	Howell, James B.	Lieut.
Berkeley	Hughes, Edgar L.	Lieut.
Long Beach	Bicknell, Stuart C.	Lieut.
Long Beach	Danley, W. H., Jr.	Lieut.
Los Angeles	Alder, Horace B.	Lieut.
Los Angeles	Colby, Albert D.	Cmdr.
Los Angeles	Greenstein, Stanley D.	Lieut.
Los Angeles	Meyer, Robert D.	Lieut.
Los Angeles	Papac, Joe P.	Lieut.
Los Angeles	Winkler, Gerald P.	Lieut.
Pasadena	Sorbonne, Robert L.	Lieut.
San Diego	Oswald, Donald W.	Lieut.
San Francisco	Kelley, Richard B.	Lieut.
San Francisco	Schneider, Herbert D.	Lieut.
San Francisco	Schuchard, Alfred S.	Lieut.
San Francisco	Stookey, Quinby	Lieut.
San Pedro	Hartley, Jack L.	Lieut.
Santa Barbara	Pampeyan, E. H.	Lieut.
Sonora	Defiebre, Bruce K.	Lt.Cmdr.

Colorado

Colorado Springs	Crawford, Hubert L.	Lieut.
Paonia	Thornburg, Garth W.	Lieut.
Pueblo	Carara, Charles E.	Lieut.

Connecticut

Bridgeport	Greenbaum, M. W.	Lieut.
Hartford	Smith, Robert S.	Lieut.
New Haven	Lazaroff, Alvin	Lieut.
New Milford	Buker, W. H., Jr.	Lieut.
Stamford	Lubell, Arthur	Lieut.
Torrington	Lavalette, Robert W.	Lieut.
Torrington	O'Meara, John O.	Lieut.
Willimantic	Shilberg, Sidney	Lieut.

District of Columbia

Washington	Cohen, Morton	Lieut.
Washington	Kelso, Charles L.	Lieut.
Washington	Minogue, Robert A.	Lieut.
Washington	Pitt, John F.	Lieut.

Florida

Miami	Pacetti, Orrin D., Jr.	Lieut.
St. Petersburg	Dunbar, Ulma F.	Lieut.

Georgia

Atlanta	Johnston, H. B., Jr.	Lieut.
Atlanta	Jones, Roy L.	Lieut.
Atlanta	Lilly, Raymond L.	Lieut.
Columbus	Doub, Myron J., Jr.	Lieut.
Newnan	Starr, Kirby W., Jr.	Lieut.
Smyrna	Collins, Joseph M.	Lieut.
Valdosta	Jones, Charles C.	Lieut.

Idaho

Coeur d'Alene	Shaver, Richard S.	Lieut.
Lava Hot Springs	Hobson, John R.	Lieut.
Rexburg	Taylor, Lloyd D.	Lieut.
Twin Falls	Callow, Lyle W.	Lieut.

Illinois

Carrollton	Levi, Robert H.	Lieut.
Centralia	Gambill, W. H., Jr.	Lieut.
Chicago	Behm, Elmer H.	Lieut.
Chicago	Frazin, Emanual	Lt. Cmdr.
Chicago	Griffin, Edward G. J.	Lieut.
Chicago	Lagorio, Robert J.	Lieut.
Chicago	Lynch, Steve W.	Lieut.
Chicago	Meesis, R. R.	Lt. Cmdr.
Chicago	Orth, Michael M.	Lieut.
Chicago	Peterson, H. M.	Lt. Cmdr.
Chicago	Stackler, Harold M.	Lieut.
Chicago	Tauman, David I.	Lieut.
Chicago	Thodos, Harry R.	Lieut.
Evanston	Harnden, Leo, Jr.	Lieut.
Fox River Grove	Sedivec, George	Lieut.
Morris	Clayton, Earl J.	Lieut.
Oak Park	Doyle, Eymard L.	Lieut.
Oak Park	Wittke, Harvey A.	Lieut.
Rock Island	Sanders, Samuel T.	Lieut.
Sterling	Reynolds, Gordon S.	Cmdr.
Taylorville	Moler, John L.	Lieut.
Waukegan	Krueger, George E.	Lieut.
Xenia	Hancock, Joseph G.	Lieut.

Indiana

Bourbon	Logan, Frederic D.	Lieut.
Elkhart	Glenn, Robert E.	Lieut.
Evansville	Helm, Olin F.	Lieut.
Indianapolis	Mertz, James R.	Lieut.
Indianapolis	Mitchell, J. Weir	Lieut.
South Bend	Huff, Roger W.	Lieut.
South Bend	Naus, James H., Jr.	Lieut.

Iowa

Anita	Roe, Jackson H.	Lieut.
Bettendorf	Wormley, Charles H.	Lieut.
Clarinda	Woods, Walter W.	Lieut.
Davenport	Scherer, George F.	Lt.Cmdr.
Des Moines	Ostrem, Carl T.	Cmdr.
Dubuque	Clewell, Robt. W., Jr.	Lieut.
Lamoni	Jefferies, Frank C.	Lieut.
Manilla	Hawk, Merton V.	Lieut.
Remsen	Kestel, Harold J.	Lieut.
Sac City	Prendergast, Robert J.	Lieut.

Kansas

Burlington	Thimes, Carl B.	Lieut.
Coffeyville	Williams, Leonard E.	Lieut.
Seneca	Gallagher, Howard I.	Cmdr.

Kentucky

Cumberland	Whitaker, Rodney B.	Lieut.
Henderson	Hopkins, Charles E.	Lieut.
Maysville	Knight, Joseph F.	Lieut.

Louisiana

Abbeville	Stuller, Gilbert F.	Lieut.
Algiers	Nolan, Alvin W.	Lieut.
Clinton	Munson, E. O., Jr.	Lieut.
Gueydan	Bonin, Louis J.	Lieut.
Houma	Savoie, Isaac J.	Lieut.
New Orleans	Dupuy, Larry J.	Capt.
New Orleans	Faget, Edward H.	Lieut.
New Orleans	Phillips, Austin G.	Lieut.
New Orleans	Tomeny, Philip J.	Lieut.
Shreveport	Tenney, William B.	Lieut.

Maine

Bar Harbor	Wasgatt, Richard D.	Lieut.
Sanford	Hunt, John W.	Lieut.
Southwest Harbor	Gilley, Frank P.	Lieut.

Maryland

Baltimore	Greenberg, H. H.	Lt. Cmdr.
Baltimore	Merriam, Robert F.	Lieut.
Frederick	Campbell, Ralph D.	Cmdr.
Hagerstown	Prather, R. B.	Lt. Cmdr.
Towson	Flesher, Eugene E.	Lieut.

Massachusetts

Belmont	Hodder, Edwin J.	Lieut.
Boston	Green, Sumner N.	Lieut.
Brookline	McCurtain, John D.	Lieut.
Chicopee Falls	LaFreniere, E. A.	Lieut.
Dedham	Welch, William F.	Cmdr.
Lynn	Browne, Irving J.	Lieut.
Marblehead	Cole, Raymond F., Jr.	Lieut.
Marblehead	Sturgis, E. A., Jr.	Lt. Cmdr.
Mattapan	Lapidus, Charles S.	Lieut.
Nahant	Famulari, Dominic F.	Lieut.
Newton Highlands	Hennessy, T., Jr.	Lieut.
Salem	Stone, Wilbur A.	Lt. Cmdr.
Springfield	Emirzian, Ashod A.	Lieut.
Waltham	Galin, Stanley A.	Lt. Cmdr.

Michigan

Detroit	Ataman, Myron T.	Lieut.
Detroit	Fuchs, Milton	Lieut.
East Lansing	Dwight, Wendell H.	Lieut.
Grand Ledge	Baribeau, C. A., Jr.	Lieut.
Grosse Pointe Park	Kotz, Edward A.	Lieut.
Highland Park	Arends, Raymond T.	Lieut.
Hudsonville	Ensing, Ernest	Lieut.
Lincoln Park	Renwick, Ralph G.	Lieut.
Royal Oak	Chaput, Robert J.	Lieut.
Saginaw	Kettelhohn, Arthur F.	Lieut.
Sparta	Brace, Gordon Q.	Lieut.

Minnesota

Cokato	Anderson, Delbert R.	Lieut.
Hopkins	Johnson, William F.	Lieut.
Minneapolis	Frankel, Irving	Lieut.
Minneapolis	Gimpel, Aaron J.	Lieut.
Minneapolis	Hartkopf, Eugene C.	Lieut.
Minneapolis	Wilkinson, Charles L.	Lieut.
Red Lake Falls	Harris, Jack G.	Lt. Cmdr.
St. Paul	Buetow, Harry P. A.	Lieut.
Tofte	Tofte, Hubert J.	Lieut.

Mississippi

Bay Springs	Massey, Samuel M.	Lieut.

Missouri

Carrollton	Trefz, William G.	Lieut.
Jackson	Kies, Vinyard L.	Lieut.
Kansas City	Donathan, G. D., Jr.	Lieut.
Kansas City	McGee, Glen H.	Lieut.
Lamar	Dimond, Ralph W.	Lieut.
Richmond	Whiteman, James R.	Lieut.
St. Louis	Buchert, Russell W.	Lieut.
St. Louis	Colpitts, Ralph W.	Lieut.
St. Louis	McGirl, Harold E.	Lieut.
Shell Knob	Sanders, Milford	Lieut.
Springfield	Tharp, Ray A.	Lieut.

Montana

Glasgow	Bundy, Donald C.	Lieut.

Nebraska

Howells	Drahota, Randolph J.	Lieut.
Lincoln	Mahan, William F.	Lieut.
Shubert	Wais, Joseph W.	Lieut.

New Hampshire

Dover	Janetos, Dion S.	Lt. Cmdr.
Milford	Lawrence, R. W.	Cmdr.

New Jersey

Collingswood	Meyer, Robert L.	Lieut.
East Orange	Bisgeier, William R.	Lieut.
East Orange	Kahn, Robert G.	Lieut.
East Paterson	Dumanski, John S.	Lieut.
Elizabeth	Yecalsik, Sol	Lieut.
Glen Ridge	Darlington, H. T., Jr.	Lieut.
Hackensack	Mindlin, Irwin	Lieut.
Irvington	Zitelli, Philip V.	Lieut.
Manasquan	Tassini, Charles	Lt. Cmdr.
Newark	Halpern, Leo S.	Lieut.
Newark	Segal, William	Lieut.
Passaic	Selzer, Louis A.	Lieut.
Penns Grove	Siris, Sydney M.	Lieut.
Tenafly	Holliday, Paul H.	Lieut.

New York

Albany	Dittmar, A. G., Jr.	Lieut.
Babylon	Beyers, Gerald S.	Lt. Cmdr.
Belle Harbor	Schwartz, Harold	Lieut.
Bronx	Friedman, Marvin	Lieut.
Bronx	Goldenberg, Harold	Lieut.
Bronx	Manzi, Walter E.	Lieut.
Bronx	Parker, Norman R.	Lieut.
Bronx	Rosenfeld, Mortimer	Lieut.
Bronx	Schmookler, L. B.	Lieut.
Brooklyn	Brett, Albert J.	Lieut.
Brooklyn	Cohen, Maurice	Lieut.
Brooklyn	Landsman, George	Lieut.
Brooklyn	Lezzi, Salvatore A.	Lieut.
Brooklyn	Lombardo, G. J.	Lieut.
Brooklyn	Manes, Stanley L.	Lieut.
Brooklyn	Maroney, George E.	Lieut.
Brooklyn	Mondshine, Stanley	Lieut.
Brooklyn	Muroff, Arthur R.	Lieut.
Brooklyn	Oliveri, Gaspar A.	Lieut.
Brooklyn	Sarkady, Lester S.	Lieut.

Brooklyn	Shmagin, Norman H.	Lieut.
Buffalo	Blach, Stanley B.	Lieut.
Buffalo	Celmer, Emilian J.	Lieut.
Buffalo	Joseph, Robert L.	Lt. Cmdr.
Dobbs Ferry	McSweeney, John T.	Lieut.
Freeport	Cohen, Joseph M.	Lieut.
Geneva	Carpenter, Collins W.	Lieut.
Jackson Heights	Paret, Morton A.	Lieut.
Jackson Heights	Tobin, Daniel F.	Lieut.
Kenmore	Metzen, Robert J.	Lieut.
Mountaindale	Jacobs, Nathan	Lieut.
Newburgh	Robinson, Maurice C.	Lieut.
New York	Jaffee, Paul	Lieut.
New York	Klinger, Seymour S.	Lieut.
New York	LoBalbo, Azzimiro P.	Lieut.
New York	Ollendorf, Gerald H.	Lieut.
New York	Polisar, Robert S.	Lieut.
New York	Stone, Sanford B.	Lieut.
New York	Turin, William	Lieut.
N. Tonawanda	Pane, Anthony J.	Lieut.
Palmyra	Brandetsas, James G.	Lieut.
Parish	Harter, William F.	Lieut.
Rochester	Caruana, Alfred E.	Lieut.
Rockville Centre	Klippel, Jack G.	Lieut.
Solvay	Gettino, Richard N.	Lieut.
Utica	Heintz, Edward M.	Lieut.
	North Carolina	
Elkin	Graham, Richard H.	Lieut.
Elkin	Harrell, James A.	Lieut.
King	Stone, Isaac F.	Lieut.
Kingston	Dupree, Louis J., Jr.	Lieut.
Raleigh	Pearson, E. A., Jr.	Lt. Cmdr.
Rockingham	Hamer, T. N.	Lt. Cmdr.
Smithfield	Massey, Samuel H., Jr.	Lieut.
Thomasville	Welborn, Sam J., Jr.	Lieut.
	Ohio	
Akron	Tapper, Irving B.	Lt. Cmdr.
Barnesville	Hasbrouck, F. R.	Lieut.
Berea	Hoch, George W.	Lieut.
Cincinnati	Albert, Jerome B.	Lieut.
Cleveland	Brill, Harold C.	Lieut.
Cleveland	Nagy, William H.	Lieut.
Cleveland	Steigerwald, R. P.	Lt. Cmdr.
Columbus	Bluff, John R.	Lieut.
Columbus	Buker, Wallace D.	Lieut.
Columbus	Fillinger, George O.	Lieut.
Columbus	Miller, Charles W.	Lieut.
Elyria	Elliott, Duke M.	Lieut.
Girard	Saare, Eugene D.	Lieut.
Leetonia	Nicolette, Arthur G.	Lieut.
Newark	McFadden, E. C.	Lieut.
New Middletown	Harmon, Duncan D.	Lieut.
Poland	Millman, James E.	Lieut.
Shaker Heights	Albert, Gerald L.	Lieut.
University Hts.	Shore, Lewis L.	Lieut.
	Oklahoma	
Broken Arrow	Delk, Mack B.	Lieut.
Elgin	Martin, Edwin P.	Lieut.
Geary	Garvey, John J.	Lieut.
Henryetta	Ogden, Ingram W.	Lieut.
Norman	Easterling, Henry C.	Lieut.
Stillwater	Heller, David E.	Lieut.
Stillwater	Merritt, Homer J.	Lieut.
	Oregon	
Philomath	Manning, James C.	Lieut.
Portland	Eldred, Bert E.	Lieut.
Portland	Hice, Thurman L.	Lieut.
Portland	Ihringer, Lynn F.	Lieut.
Portland	Kerr, Harry G., Jr.	Lieut.
Portland	Lewis, Gail Z.	Lieut.
Portland	Schatz, Howard P.	Lieut.
Portland	Waltz, Marcus E.	Lieut.
Portland	Whisler, Robert J.	Lieut.
Salem	Chapman, C. K.	Lt. Cmdr.
Silverton	Moe, John R.	Lieut.
Warrenton	Stanley, Duncan B.	Lieut.
Woodburn	Mattson, Floyd G.	Lieut.
	Pennsylvania	
Elizabethtown	Moore, William K.	Lieut.
Irwin	Watkiss, George E.	Lieut.
Lebanon	Flowers, Robert C.	Lieut.
Lititz	Huber, Robert B.	Lieut.
Merion	Schreiber, F. C.	Lieut.
Millersburg	Stockdale, Clifford G.	Lieut.
Monongahela	Ivill, Paul W.	Lieut.
New Castle	Stutz, Leonard	Lt. Cmdr.
Philadelphia	Amsterdam, Morton	Lieut.
Philadelphia	Benedict, Benjamin	Capt.
Philadelphia	Greene, David J.	Lieut.
Philadelphia	McAfee, C. E., Jr.	Lieut.
Philadelphia	Stanton, Paul F.	Lieut.
Pittsburgh	Hardiman, J. M., Jr.	Lieut.
Pittsburgh	McCartney, H. E.	Lt. Cmdr.
Wyomissing	Ruth, James A.	Lieut.
	Rhode Island	
Cranston	Puerini, Albert C. J.	Lieut.
Providence	Sullivan, Allyn F.	Lieut.
Saunderstown	Jordan, Arthur	Lieut.
	South Carolina	
Rock Hill	Makintosh, Robert H.	Lieut.
Spartanburg	Praytor, Ralph B.	Cmdr.
	South Dakota	
Deadwood	Berry, John J.	Lieut.
	Tennessee	
Cleveland	Browder, Joseph K.	Lieut.
Memphis	Thompson, D. M.	Lieut.
	Texas	
Beaumont	Blades, Joseph D.	Lieut.
Canyon	Vaughan, Olin B.	Lieut.
Gilmer	Daniels, Douglas R.	Lieut.
Houston	McConnell, Julius D.	Lieut.
Houston	Pfluger, Werner M.	Lieut.
Houston	Roemer, Paul C., Jr.	Lieut.
Lockhart	Cardwell, Milton A.	Lieut.
McGregor	Krause, Paul G.	Lieut.
Port Arthur	Colletti, Paul F.	Lieut.
Sonora	Logan, Joseph B.	Lieut.
Terrell	Swords, Claude E.	Lieut.
Tyler	Urbach, Arthur	Lieut.
	Utah	
Ephraim	Peterson, Charles W.	Lieut.
	Vermont	
Newport	Hamilton, Samuel, Jr.	Lieut.

	Virginia	
Narrows	Carr, John A.	Lieut.
Warrenton	Risdon, Edward D.	Lieut.
	Washington	
Anacortes	Nicholson, L. E.	Lt. Cmdr.
Bellingham	German, Wm. M., Jr.	Lieut.
Bremerton	Christensen, Wm. H.	Capt.
Kennewick	Byrd, Donald W.	Cmdr.
Puyallup	Clarke, Alan Y.	Lieut.
Spokane	Blakemore, M. E.	Lieut.
Spokane	Esposito, Russell P.	Lieut.
	West Virginia	
Charleston	Baker, Nathan P.	Lieut.
Charleston	Goldstein, Philip M.	Lieut.
Huntington	Miller, Robert E.	Lieut.
Parkersburg	Boyers, Chas. E.	Lt. Cmdr.
Ward	Copher, Harry O.	Lt. Cmdr.
	Wisconsin	
Eau Claire	Lee, John D.	Lieut.
Grantsburg	Giswold, William R.	Lieut.
LaCrosse	Siewert, Donald H.	Lieut.
Milwaukee	Blanchard, Frank L.	Lieut.
Milwaukee	Counihan, Richard F.	Lieut.
Milwaukee	Kurth, Charles R.	Lt. Cmdr.
Milwaukee	Lewis, Ralph I.	Lt. Cmdr.
Monroe	Walker, George W.	Lieut.

LIST OF ARMY DENTAL OFFICERS SEPARATED FROM SERVICE

The following list of dental officers separated from the Army Dental Corps does not include rank because such information is no longer furnished by the Surgeon General's Office. Publication will be given to other names as soon as possible.

	California
Berkeley	Graves, Don C.
Lemoore	Burke, Allyn D.
	Connecticut
New Haven	Neclerio, Thomas A.
	District of Columbia
Washington	Hughes, Albert G.
	Florida
Ft. Lauderdale	Forum, Charles W., Jr.
Orlando	Ewing, William T., Jr.
	Indiana
Crawfordsville	Fraser, John E.
Hammond	Courtice, Clyde J.
	Kentucky
Bowling Green	Gerard, Paul E.
	Louisiana
Houma	Ellender, Henry T.
	Massachusetts
Easthampton	Daniello, Robert J.
Swansea	Weiser, Bernard
	Mississippi
Baldwyn	Drummond, Ozie
	Nevada
Reno	Vacchina, Aldo R.
	New Jersey
Bayonne	Gurland, Jesse
Orange	Ross, Ira F.
Paterson	Nochimson, Bernard
Rutherford	Glick, George H.
	New York
Brooklyn	Goldman, David S.
Brooklyn	Poster, Marvin M.
	North Dakota
Garrison	Stewart, Roy C.
	Ohio
Chillicothe	McKenzie, Thomas K.
Yorkville	Hill, Parvy, Jr.
	Oklahoma
Elk City	Turnbull, Cecil W.
Lawton	Shadid, Ralph J.
	Oregon
Albany	Gray, Joseph C.
Portland	Johnson, Bert A.
	Pennsylvania
California	Mills, James M.
Johnstown	McAneny, William B.
Pittsburgh	Littman, Irwin J.
	Rhode Island
Pawtucket	Yacovone, Joseph A.
Providence	Reynolds, Joseph R.
	Tennessee
Clarksville	Smith, Samuel B.
Knoxville	Jenkins, Clarence E.
Memphis	Meredith, Hubert M.
Memphis	Metz, Louis C.
	Texas
Arlington	Hollingsworth, Borden B.
Athens	Hawn, Frank L.

Ballinger	Boelsche, Edgar H.
Childress	Nabers, John M.
Dallas	Bryarly, Richard C.
Dallas	House, David
Dallas	Starks, Chad B.
El Paso	Thall, A. B.
Ft. Worth	Eaves, John D., Jr.
Galveston	Grohosky, Harold S.
Houston	Blonstein, Dave
Houston	Carpenter, Charles L.
Houston	McCall, Oliver P.
Houston	Schmidt, Lawrence W.
Jasper	Bird, Noel W.
McAllen	O'Grady, John J.
San Antonio	Maurer, Leslie D.
San Antonio	Reimer, John K.
San Antonio	Robinson, John E.
	Vermont
Woodstock	Woods, Wendell D.
	Virginia
Alexandria	Dreifus, Carl T.
Kilmarnock	Edmonds, Henry J.
Phoebus	Gray, Joe
	Washington
Aberdeen	Canterbury, John E.
Dayton	Trudgeon, Arthur D.
Issaquah	Anderson, Berge A.
Kent	Barnes, George A.
Kirkland	Nelson, Richard L.
Puyallup	Vitous, Elmer O.
Seattle	Hennessy, Terence P.
Seattle	Ingram, Neal H.
Seattle	Roberts, Clyde R., Jr.
Seattle	Weaver, Paul P.
Spokane	Hopkins, Grant A.
Spokane	Renn, Waldo A.
Tacoma	Eddy, Edward
Tacoma	Hanson, John P.
Tacoma	Klopping, Edward C.
Waitsburg	Mansfield, Oliver H.
Yakima	Taylor, Thomas W.
	West Virginia
Fairmont	Thompson, Lester W.
Lumberport	Wolf, Sheldon L.
Wheeling	Ballam, Norman G.
	Wisconsin
Appleton	Perschbacher, Ray G.
Baldwin	Njos, Eldon J.
Beaver Dam	Temkin, Sam
Beloit	Quinn, William K.
Bonduel	Surdell, Stanley S.
Glidden	Schwert, Eugene H.
LaCrosse	Lynch, Robert E.
Madison	Hurtgen, Peter J.
Marshfield	Van Patter, Dean J.
Merrill	Ryan, Francis J.
Milwaukee	Hoffman, Max
Milwaukee	Wiech, Louis S.
Neenah	Jern, John A.
Oshkosh	Geary, Robert C.
Oshkosh	Schaefer, William T.
Phillips	Simerson, Fayette H.
Racine	Mahnke, Eugene J.
Racine	Stommel, Russel J.
Reedsburg	Erickson, Arthur C.
Rosholt	Kruzicki, Bernard D.
Sheboygan	Butler, James M.
Sheboygan	Kalk, James H.
Spooner	Hassemer, Delmar J.
Stevens Point	Crosby, Leland B.
Stevens Point	Kiedrowski, Chester J.
Wausaukee	Jicha, Michael A.
West Bend	O'Meara, John J.
Wisconsin Rapids	Nelson, Charles N.
	Wyoming
Riverton	Vincent, Joseph A.

Capt. Clement A. Farrell, Charlottesville, Va., has been recalled to active duty.

Lt. Samuel Kaplan, Brooklyn, N. Y., was erroneously reported as discharged from the Army Dental Corps.

DEATHS

Ackley, Thomas B., Philadelphia, Pa.; Philadelphia Dental College, 1896; died June 22; aged 70.

Ahmann, Alphonse J., Chicago, Ill.; Marquette University, School of Dentistry, 1922; died March 8; aged 47.

Allyn, Louis M., Mystic, Conn.; University of Pennsylvania; died May 31; aged 68.

Anderson, James C., Columbus, Ga.; Atlanta Dental College, 1898; died June 3; aged 69.

Austin, Milton, St. Joseph, Mo.; Kansas City Dental College, 1899; died April 20; aged 70.

Barrett, William H., Miami, Fla.; died April 26.

Bartle, Henry E., Torrington, Conn.; Creighton University, 1907; died May 11; aged 62.

Beckett, John M., Chicago, Ill.; Northwestern University, 1904; died June 12; aged 71.

Blachly, H. L., Sentinel, Okla.; died April 24; aged 63.

Bowkley, Norman G., Philadelphia, Pa.; Dental College, Temple University, 1905; died May 20.

Braun, Hugh Arthur, Davenport, Iowa; University of Iowa, 1892; died May 20; aged 74.

Brigham, Arthur F., Philadelphia, Pa.; died April 30.

Brubaker, Harry E., McComb, Ohio; Ohio Medical University, College of Dentistry, 1896; died April 14; aged 77.

Buck, Lemuel, Wenatchee, Wash.; Chicago College of Dental Surgery, 1892; died June 5; aged 77.

Buege, Royal, Marinette, Wis.; died June 2.

Carlson, Lowell H., Minneapolis, Minn.; University of Minnesota, 1912; died May 22; aged 55.

Charbonneau, Henry A., Newark, N. J.; Detroit College of Medicine, Department of Dental Surgery, 1900; died June 11; aged 70.

Christianson, Edwin R., Chicago, Ill.; Atlanta-Southern Dental College, 1922; died May 26; aged 67.

Clarke, George A., Dickinson, N. Dak.; Chicago College of Dental Surgery, 1903; died June 16; aged 70.

Corthell, M. B., Spooner, Wis.; Illinois School of Dentistry, 1901; died June 24; aged 71.

Darling, A. D., Crosby, Minn.; Northwestern University, 1900; died May 29.

Dicus, Clarence C., Mexico, Mo.; Western Dental College; died April 9; aged 67.

Ellis, J. B., Maquoketa, Iowa; University of Iowa, 1892; died May 29; aged 76.

Euler, George H., Irvington, N. J.; New York College of Dental Surgery, 1890; died May 28.

Flanagan, Joseph E., Worcester, Mass.; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania, 1901; died June 20; aged 73.

Forsyth, Edgar L., Detroit, Mich.; University of Michigan, 1921; died May 21; aged 47.

Fox, C. H., Bakersfield, Calif.; College of Physicians and Surgeons; died June 8; aged 91.

Francke, Herman A., Kansas City, Mo.; Western Dental College, 1905; died May 17; aged 72.

Furnier, William M., Pittsburgh, Pa.; University of Pittsburgh, 1919; died June 24; aged 49.

Gelabert, Erskine M., Long Beach, Calif.; Kansas City Dental College, 1914; died April 19; aged 57.

Gesell, Herbert R., Garden City, N. Y.; New York College of Dentistry, 1913; died July 10; aged 55.

Godward, Charles H., Elbow Lake, Minn.; Northwestern University, 1898; died June 1; aged 72.

Grant, C. S., Joplin, Mo.; died May 12; aged 87.

Hackett, Gordon G., Detroit, Mich.; Detroit College of Medicine, Department of Dental Surgery, 1898; died May 8.

Hall, Clair B., Peoria, Ill.; Kansas City Dental College; died April 16; aged 55.

Harwood, Richard N., Morristown, Tenn.; University of Tennessee, 1900; died June 15; aged 68.

Hatch, Robert E., Lincoln, Ill.; Northwestern University, 1944; died June 19; aged 24.

Heino, Julius D., Hill Valley, Calif.; College of Physicians and Surgeons; died June 10; aged 80.

Johnson, Alvin F., Chicago, Ill.; Northwestern University, 1907; died May 27; aged 63.

Kibler, O. L., Pittsfield, Ill.; Chicago College of Dental Surgery, 1895; died June 26; aged 77.

Koontz, Delbert J., Portland, Ore.; North Pacific Dental College; died May 16; aged 43.

Lane, Paul L., Chicago, Ill.; died July 13; aged 47.

Lemke, August H., Wausau, Wis.; Chicago College of Dental Surgery, 1904; died June 30; aged 77.

Lobban, Frank, Osawatomie, Kan.; Western Dental College, 1896; died April 23.

Lynch, John E., Chicago, Ill.; Chicago College of Dental Surgery, 1914; died June 12.

Mahan, Francis A., Waterbury, Conn.; Temple University; died June 10.

Maun, N. J., Tekemah, Nebr.; Northwestern University, 1899; died June 15; aged 75.

Myers, Joel E., St. Louis, Mo.; Washington University, School of Dentistry, 1901; died April 27; aged 71.

Nelson, Harold J., Fergus Falls, Minn.; University of Minnesota, 1900; died May 29; aged 68.

O'Connor, Joseph F., Scranton, Pa.; University of Pennsylvania; died May 26.

O'Neill, Mark J., Omaha, Nebr.; Lincoln and Lee Dental College; died May 27; aged 51.

Papsdorf, Paul, Chicago, Ill.; Chicago College of Dental Surgery, 1915; died June 21; aged 54.

Pearson, James R., Washington, Mo.; St. Louis University; died June 12; aged 31.

Phillips, William S., McAlester, Okla.; Western Dental College, 1908; died June 8; aged 59.

Ragan, Adrian C., Hannibal, Mo.; died May 6; aged 60.

Russell, Samuel P., Honolulu, T. H.; New York College of Dentistry, 1891; died June 18; aged 75.

Schulze, Herman J., Eveleth, Minn.; Northwestern University, 1900; died June 24; aged 72.

Shugrue, Frank J., Hartford, Conn.; Baltimore College of Dental Surgery; died May 11; aged 48.

Smith, B. A., Champaign, Ill.; Ohio Medical University, College of Dentistry, 1902; died April 29; aged 64.

Taylor, John H., Salt Lake City, Utah; died May 28.

Tucker, Clarence A., Grand Rapids, Minn.; University of Minnesota; died June 27; aged 53.

Watrous, Oliver S., Middletown, Conn.; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania, 1884; died March 9; aged 91.

Watson, Louis C., Akron, Ohio; died July 4; aged 63.

Watts, Dayton L., Amherst, Va.; School of Dentistry, Medical College of Virginia, 1922; died May 20; aged 46.

Weber, Harry B., St. Louis, Mo.; Washington University, Dental School, 1905; died May 15; aged 66.

Werner, Francis A., Philadelphia, Pa.; Philadelphia Dental College; died April 12; aged 67.

Weisbrod, David, Irvington, N. J.; College of Dentistry, New York University, 1919; died in April; aged 50.

Wheelock, J. E., Boulder, Colo.; School of Dentistry, University of Denver, 1918; died May 21; aged 67.

White, Charles A., Sr., Wakefield, R. I.; Boston Dental College; died April 2; aged 72.

Whittle, Warren S., Pine Bluff, Ark.; Kansas City Dental College, 1917; died March 7; aged 51.

Wiesler, Bernard J., Valley City, N. Dak.; died July 5; aged 47.

Wiggins, J. C., Jackson, Miss.; died February 2; aged 91.

Williams, Edward B., New Hartford, N. Y.; School of Dentistry, University of Buffalo, 1915; died June 11; aged 64.

Woodard, D. T., Jackson, Miss.; died February 2; aged 91.

Woods, Robert, Connellsville, Pa.; died February 1; aged 31.

Worley, Francis M., Abilene, Kan.; died May 7; aged 76.

Wylie, E. J., Los Angeles, Calif.; Ohio State University, 1908; died June 26; aged 71.

Young, John B., Columbus, Ohio; College of Dentistry, Ohio Medical University, 1901; died April 7; aged 65.

MEETINGS AND ANNOUNCEMENTS

Meetings of State Societies

State	*Date*	*Place*	*Secretary*	*Address*
Alabama	April 8-10, '47	Birmingham	G. W. Matthews	1922 Tenth Ave., South, Birmingham 5
Arizona			R. D. McDonald	601 Valley Bk. Bldg., Mesa
Arkansas			I. M. Sternberg	Merchants Bk. Bldg., Ft. Smith
California			L. E. Linehan	450 Sutter, San Francisco
S. California	Sept. 16-18	Los Angeles	R. L. Borland	Rm. 615, 1052 W. 6th St., Los Angeles
Colorado			M. R. Markley	Republic Bldg., Denver
Connecticut			E. S. Arnold	37 Linnard Rd., W. Hartford
Delaware			R. H. Stucklen	1003 Delaware Ave., Wilmington
District of Columbia			M. E. Colvin	1726 21st St., N.W., Washington
Florida	Nov. 11-13	Palm Beach	A. J. Fillastre	603 Marble Arcade, Lakeland
Georgia			R. H. Murphy	605 Bankers Ins. Bldg., Macon
Hawaii	Oct. 29-Nov. 3	Honolulu	J. H. Dawe	P.O. Box 39, Honolulu
Idaho			H. Miller	Moscow
Illinois	Sept. 16-19	Chicago	L. H. Jacob	Jefferson Bldg., Peoria
Indiana			E. E. Ewbank	Kingman
Iowa			A. N. Humiston	417 Higley Bldg., Cedar Rapids
Kansas	May 12-15, '47	Kansas City, Mo.	F. A. Richmond	1008 Huron Bldg., Kansas City
Kentucky			J. L. Walker	640 Barbee Way S., Louisville
Louisiana	April 10-12, '47	New Orleans	J. S. Bernhard	407 Med. Arts Bldg., Shreveport
Maine			A. H. Garcelon	State House, Augusta
Maryland			P. A. Deems	835 Park Ave., Baltimore
Massachusetts	May 5-8, '47	Boston	P. E. Adams	106 Marlborough St., Boston
Michigan			F. Wertheimer	Mich. Dept. of Health, Lansing
Minnesota			L. M. Cruttenden	498 Lowry Med. Arts. Bldg., St. Paul
Mississippi			O. L. Colee	Magnolia
Missouri	May 12-15, '47	Kansas City	C. W. Digges	Exchange Natl. Bk. Bldg., Columbia
Montana			F. E. Laing	401 Hart-Albin Bldg., Billings
Nebraska			F. A. Pierson	Fed. Securities Bldg., Lincoln
Nevada			L. G. Jacob	601 Med. Dent. Bldg., Reno
New Hampshire			F. E. Williams	814 Elm St., Manchester
New Jersey			J. G. Carr	223 E. Hanover St., Trenton
New Mexico			J. S. Eilar	First Natl. Bk. Bldg., Albuquerque
New York			C. A. Wilkie	1 Hanson Place, Brooklyn
North Carolina			C. W. Sanders	Benson
North Dakota			F. A. Maides	Grand Forks
Ohio	Nov. 11-13	Columbus	E. C. Mills	220 S. Cassady Ave., Columbus
Oklahoma			E. Wise	Med. Arts Bldg., Tulsa
Oregon			W. H. Hurley	Selling Bldg., Portland
Panama Canal Zone			I. Buchin	Post Dent. Surgeon, APO 834, c/o PM, New Orleans
Pennsylvania	May 6-8, '47	Philadelphia	E. R. Aston	421 Market St., Kingston
Philippine Islands			G. A. Carreon	9 Broadway, 3rd St., N. Manila
Puerto Rico			J. O. Porrate	16 Caribe, Santurce
Rhode Island			C. McKivergan	102 Waterman St., Providence
South Carolina	April 27-29, '47	Myrtle Beach	P. B. Hair	701 Andrews Bldg., Spartanburg
South Dakota			E. W. Elmen	Sioux Falls
Tennessee	May 5-8, '47	Nashville	E. J. Justis	Exchange Bldg., Memphis
Texas			W. Ogle	313 Med. Arts Bldg., Dallas
Utah			M. G. Kuhre	Trib.-Tel. Bldg., Salt Lake City
Vermont			J. A. Larrow	Middlebury

Virginia	J. E. John	804 Med. Arts Bldg., Roanoke
Washington	F. J. Dingler	1502 Med. & Dent. Bldg., Seattle
West Virginia	C. J. Gavelda	Clarksburg
Wisconsin	R. A. Mason	964 N. 27th St., Milwaukee
Wyoming	J. D. McNiff	Laramie

Meetings of State Boards of Dental Examiners

Arizona	Oct. 2	Phoenix	R. K. Trueblood	25 N. 2d Ave., Glendale
California	Sept. 16	Los Angeles	K. I. Nesbitt	515 Van Ness Ave., San Francisco
Florida	Oct. 28-31	Jacksonville	A. W. Kellner	P.O. Box 155, Hollywood
Kentucky	Dec. 17-20	Louisville	W. F. Walz	1114 1st Natl. Bk. Bldg., Lexington
Indiana	Sept. 16-19*	Indianapolis	C. A. Frech	Gary Natl. Bk. Bldg., Gary
Oregon	Oct. 28-Nov. 2	Portland	F. L. Utter	506 Pioneer Trust Bldg., Salem
South Dakota	Sept. 1-5	Sioux Falls	T. E. Burrington	P.O. Box 5, Rapid City
Texas	Oct. 20-25	Dallas	C. C. Hardin, Jr.	311 Norwood Bldg., Austin 16

*Sept. 17-18, hygienist examination.

Other Meetings

Name	*Date*	*Place*	*Secy. or Chm.*	*Address*
American Association of Dental Examiners	Oct. 12-13	McAllister Hotel, Miami	C. A. Bumstead Secy.	924 Stuart Bldg., Lincoln, Nebr.
American Association of Orthodontists	Sept. 30-Oct. 3	Hotel Broadmoor, Colorado Springs	Max E. Ernst Secy.	1250 Lowry Med. Arts Bldg., St. Paul
American Dental Assistants Association	Oct. 14-16	Roney Plaza & Surfside Hotels, Miami Beach	Aileen Ferguson Secy.	709 Centre St., Jamaica Plain 30, Mass.
American Dental Association	Oct. 14-16	McAllister & Columbus Hotels, Miami	Harry B. Pinney Secy.	222 E. Superior St., Chicago
American Dental Hygienists' Association	Oct. 14-16	Alcazar Hotel, Miami Beach	A. R. Fisk Secy.	1704 N. Troy St., Arlington, Va.
American Public Health Association	Nov. 11-16	Cleveland	Harold J. Knapp Chm.	Health Commissioner, Cleveland
American Society for the Advancement of Science	Oct. 28	Hotel New Yorker, N. Y.	M. Hillel Feldman, Secy.	730 Fifth Ave., New York 19
American Society of Oral Surgeons	Oct. 9-12	Roney Plaza Hotel, Miami Beach	Harry Bear Secy.	1112 E. Clay St., Richmond 19, Va.
Montreal Dental Club	Oct. 23-25	Mount Royal Hotel, Montreal	M. L. Donigan Chm.	Drummond Med. Bldg., 1414 Drummond St., Montreal
Mid-Continent Dental Congress	Nov. 4-6	Jefferson Hotel, St. Louis	E. C. Brooks Chm.	4500 Olive St., St. Louis
St. Louis University, Alumni Association	Nov. 22-23	St. Louis	O. J. Dick	1657 S. Grand Blvd., St. Louis
University of Buffalo, School of Dentistry, Alumni Association	Oct. 8-10	Hotel Statler, Buffalo	E. L. Ruffing Publicity Chm.	233 W. Ferry St., Buffalo 13
New York Society of Orthodontists	Nov. 4-5	Waldorf-Astoria Hotel, N. Y.	O. Jacobson Secy.	35 W. 81st St., New York

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The Forsyth Dental Infirmary for Children, Boston. Director, Percy R. Howe, 140 The Fenway, Boston.

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